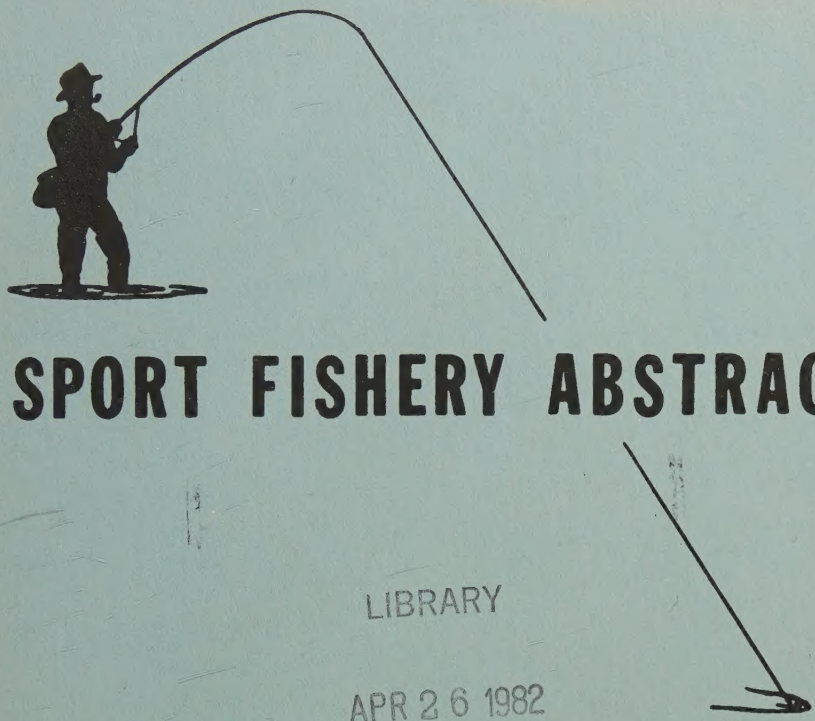
27(1)

27(1)



SPORT FISHERY ABSTRACTS

LIBRARY

APR 2 6 1982

National Marine Fisheries Service
2570 Dole Street
Honolulu, Hawaii

Vol. 27, No. 1, 1982

DEPARTMENT OF THE INTERIOR
U. S. FISH AND WILDLIFE SERVICE

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

SPORT FISHERY ABSTRACTS

Roger Schoumacher, Editor
Terry N. Sexson, Assistant Editor

Editorial Office
U.S. Fish and Wildlife Service
Aylesworth Hall, CSU
Fort Collins, Colorado 80523

Sport Fishery Abstracts is intended to furnish fishery biologists with abstracts of current literature in sport fishery research and management.

One volume, consisting of four numbers, is issued each year. Each number contains separate Author, Geographic, and Taxonomic indexes, and the final number of each volume contains cumulative Author, Geographic, Taxonomic, and Subject indexes, and a list of publications screened. Authors who publish in journals not screened for *Sport Fishery Abstracts,* and who would like their publications included, should submit abstracts to the Editor.

The U.S. Fish and Wildlife Service assumes no responsibility for the accuracy of material from outside sources, and can only supply copies of articles written and published by the U.S. Fish and Wildlife Service.

SPORT FISHERY ABSTRACTS

An abstracting service for fishery research and management

Volume 27 Number 1 1982

CONTENTS

AQUATIC PLANTS AND THEIR CONTROL 1

CULTURE AND PROPAGATION

General Fish Culture 1
Trout and Salmon Culture 2
Other Andromous Species Culture 3
Warmwater Culture 3
Mariculture 4
Feeds, Feeding and Nutrition 5
Transporting Fish 6

LIMNOLOGY AND OCEANOGRAPHY

General 6
Chemical 6
Benthos 7
Plankton 7

MORPHOLOGY, PHYSIOLOGY, GENETICS AND BEHAVIOR

Morphology 7
Physiology 11
Genetics, Variation Studies, Hybridization 21
Behavior 23

NATURAL HISTORY

Life Histories - General Works 27
Population Studies - Production, Standing Crop, Recruitment. 30
Spawning Habits and Movements, Sex Ratios, Fecundity, etc... 32
Movements, Seasonal and Depth Distribution, etc. 35
Foods and Feeding 36
Age and Growth 39
Geographical Distribution, Fish surveys, etc. 42
Abundance, Factors of; Survival and Mortality 45
Identification, Keys, Classification 46

PARASITES AND DISEASES

General..... 49
Bacterial 49
Protozoan 50
Other 51

POLLUTION AND TOXICOLOGY

Pollution 53
Fish Kills 56
Toxicology; Bioassays 57
Fish Toxicants 59

RESEARCH AND MANAGEMENT

General 60
Administration and Planning 60
Reports of Fishery Stations, States, etc. 60
Habitat Alterations 61
Harvest, Creel Census, etc. 61
Regulations 61
Fish Control and Removal 62
Marking and Tagging 62
Stocking and Introductions 62
Fishing Gear and Techniques 63
Fertilization of Water and Soil 64
Fishways, Fish Passage through Dams, etc. 64
Mathematical, Statistical Methods and Modeling 65
Lake Management and Research 65
River and Stream Management and Research 66
Farm Pond and Small Impoundment Management and Research 66
Large Impoundment Management and Research 66
Estuary Management and Research 67
Marine Management and Research 67
Utilization of Fishery Products 67
Miscellaneous Techniques and Equipment 68
Reviews, Bibliographies, etc. 68

AUTHOR INDEX (Salmon) 69
GEOGRAPHIC INDEX (Yellow) 85
SYSTEMATIC INDEX (Blue) 89

AQUATIC PLANTS AND THEIR CONTROL

82-000001 Shireman, J. V. and M. J. Maceina. THE UTILIZATION OF GRASS CARP, *CTENOPHARYNGODON IDELLA* VAL., FOR HYDRILLA CONTROL IN LAKE BALDWIN, FLORIDA. *J. Fish Biol.* 19(6):629-636. Dec. 1981. SFA 27(1)
[Sch. For. Resour. Conserv., Univ. Fla., Gainesville] Grass carp, *Ctenopharyngodon idella*, >300 mm t.l. were stocked in Lake Baldwin, Florida during 1978 (24 fish ha^{-1}) to evaluate their effectiveness for hydrilla control. Hydrilla, *Hydrilla verticillata*, was nearly eradicated from Lake Baldwin 2 years after stocking. Control was effective with 130 kg grass carp ha^{-1} of hydrilla and control was definite when biomass exceeded 185 kg ha^{-1} of hydrilla. Grass carp growth was rapid during the first two years as fish reached 9·17 kg by June 1980. Grass carp >6kg consumed 25-28% of their body weight of hydrilla per day. The use of grass carp for vegetation management is discussed.

GENERAL FISH CULTURE

82-000002 Ghittino, P. PRINCIPALI POSSIBILITÀ E PROBLEMI DELLA PISCICOLTURA IN REGIONE PIEMONTE. [MAIN POSSIBILITIES AND PROBLEMS OF FISH FARMING IN THE REGION OF PIEDMONT, ITALY.] *Riv. It. Piscic. Ittiop.* 16(3):69. July-Sept. 1981. In Italian with English summ. SFA 27(1)
[Inst. Zooprof. Sper. Piemonte, Liguria e Valle d'Aosta - Via Bologna, 148-10154 Torino, Italy]

82-000003 Jagoe, C. J.; D. P. Small; R. L. Blake; S. Woodward; D. C. Smith and J. R. Moring. COMMERCIAL AQUACULTURE OF FISHES IN MAINE: STATUS AND FUTURE PROSPECTS. *Fisheries (Bull. Am. Fish. Soc.)* 6(5):16-24. Sept.-Oct. 1981. SFA 27(1)
[Migratory Fish Res. Inst., Dep. Zool., Univ. Me., Orono 04469]

82-000004 Shang, Y. C. A COMPARISON OF REARING COSTS AND RETURNS OF SELECTED HERBIVOROUS, OMNIVOROUS, AND CARNIVOROUS AQUATIC SPECIES. *Mar. Fish. Rev.* 43(9):23-24. Sept. 1981. SFA 27(1)
[Dep. Agric. Resour. Econ., Univ. Hawaii, Honolulu 96822]

82-000005 Zolotnitskiy, A. P. SOME DATA ON THE GONADOTROPIC ACTIVITY OF THE HYPOPHYSIS IN THE BLACK SEA TURBOT *SCOPHTHALMUS MAEOTICUS* IN CONNECTION WITH STORAGE TIMES. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):160-162. 1980. SFA 27(1)
[AzCherNIRO, Kerch, USSR] The data obtained indicate that with long storage a decrease occurs in the gonadotropic activity of the hypophyses, which must be taken into account when calculating the doses of hypophyseal material earmarked for inducing the maturation and spawning of spawners. Since the times for collection of the hypophyses of the Black Sea turbot are restricted, glands kept for a long time (up to 5 years) can be used in addition to freshly prepared ones for fisheries purposes. The collection and storage of hypophyses must necessarily be carried out differentially, according to the sex of the fish.--From text.

TROUT AND SALMON CULTURE

82-000006 Allen, W. V. and G. H. Allen. AMINO ACIDS IN THE FOOD WEB OF A WASTEWATER AQUACULTURE SYSTEM FOR REARING JUVENILE SALMON. *Prog. Fish.-Cult.* 43(4):178-182. Oct. 1981. SFA 27(1)
[Biol. Dep., Humboldt State Univ., Arcata, CA 95521]

82-000007 Donaldson, E. M.; G. A. Hunter and H. M. Dye. INDUCED OVULATION IN COHO SALMON (*ONCORHYNCHUS KISUTCH*). III. PRELIMINARY STUDY ON THE USE OF THE ANTIESTROGEN TAMOXIFEN. *Aquaculture* 26(1-2):143-154. Nov. 1981. SFA 27(1)
[Dep. Fish. Oceans, 4160 Marine Dr., West Vancouver, BC V7V 1N6, Canada]

82-000008 Donaldson, E. M.; G. A. Hunter and H. M. Dye. INDUCED OVULATION IN COHO SALMON (*ONCORHYNCHUS KISUTCH*). II. PRELIMINARY STUDY OF THE USE OF LH-RH AND TWO HIGH POTENCY LH-RH ANALOGUES. *Aquaculture* 26(1-2):129-141. Nov. 1981. SFA 27(1)
[Dep. Fish. Oceans, 4160 Marine Dr., West Vancouver, BC V7V 1N6, Canada]

82-000009 Hunter, G. A.; E. M. Donaldson and H. M. Dye. INDUCED OVULATION IN COHO SALMON (*ONCORHYNCHUS KISUTCH*). I. FURTHER STUDIES ON THE USE OF SALMON PITUITARY PREPARATIONS. *Aquaculture* 26(1-2):117-127. Nov. 1981. SFA 27(1)
[Dep. Fish Oceans, 4160 Marine Dr., West Vancouver, BC V7V 1N6, Canada]

82-000010 Peňáz, M. and J. Příhoda. REPRODUCTION AND EARLY ONTOGENY OF *HUCHO HUCHO*. *Acta Sci. Nat. Brno* 15(6):1-33. 1981. In English with Russian summ. SFA 27(1)

82-000011 Torrissen, O.; E. Tidemann; F. Hansen and J. Raa. ENSILING IN ACID--A METHOD TO STABILIZE ASTAXANTHIN IN SHRIMP PROCESSING BY-PRODUCTS AND IMPROVE UPTAKE OF THIS PIGMENT BY RAINBOW TROUT (*SALMO GAIRDNERI*). *Aquaculture* 26(1-2):77-83. Nov. 1981. SFA 27(1)
[Inst. Mar. Res., Matre Aquacult. Stn., Matredal, Norway]

82-000012 Whoriskey, F. G.; R. J. Naiman and W. L. Montgomery. EXPERIMENTAL SEA RANCHING OF BROOK TROUT, *SALVELINUS FONTINALIS* MITCHILL. *J. Fish Biol.* 19(6):637-651. Dec. 1981. SFA 27(1)
[R. J. Naiman: Woods Hole Oceanographic Inst., Woods Hole, MA 02543] An experiment to induce anadromy in a populaton of wild brook trout, *Salvelinus fontinalis*, was conducted near Sept-Iles, Quebec, in 1978-1979. Brook trout were captured from the Matamek River, tagged and transported to the Matamek River estuary during late spring and early summer, and allowed free movement between an impassable waterfall 0·7 km upstream and the sea. Fish were recaptured in autumn as they returned to fresh water. Over two years, 34·0% of the released fish were recaptured. Best returns were in the 2+ and 3+ age classes with 38·0 and 62·1% recaptured, respectively. Straying of transplanted fish appeared to be <1%. All age classes included sea run brook trout (sea trout) but the largest percentages of sea trout occurred in older fish. Growth was better in sea trout than in fish which did not develop anadromy, presumably a function of an increased food supply at sea. Severe tagging effects stunted growth and probably suppressed anadromy, especially among younger fish. Sexual characteristics of recaptured fish indicted supressed maturation of gonads in sea trout compared to fish remaining in fresh water and there was a shift to a larger percentage of females in the sea trout. Comparisons between our results and data on

TROUT AND SALMON CULTURE (CONTINUED)

82-000012 CONTINUED other anadromous *Salvelinus* species underscore the potential for sea ranching of trout and char as moderate effort, high yield aquaculture technique.

OTHER ANADROMOUS SPECIES CULTURE

82-000013 Braid, M. R. and E. W. Shell. INCIDENCE OF CANNIBALISM AMONG STRIPED BASS FRY IN AN INTENSIVE CULTURE SYSTEM. *Prog. Fish.-Cult.* 43(4):210-212. Oct. 1981. SFA 27(1)
[Dep. Biol., Univ. Montevallo, Montevallo, AL 35115]

82-000014 Woods, L. C. III; J. H. Kerby; M. T. Huish; G. M. Gafford and W. L. Rickards. CICULAR TANK FOR INTENSIVE CULTURE OF HYBRID STRIPED BASS. *Prog. Fish.-Cult.* 43(4):199-200. Oct. 1981. SFA 27(1)
[N.C. Coop. Fish. Res. Unit, N.C. State Univ., Raleigh 27650]

WARMWATER CULTURE

82-000015 Buttner, J. K. ASIATIC CLAM IN CHANNEL CATFISH REARING PONDS: ITS BIOLOGY AND ITS EFFECT ON WATER QUALITY. *Ph.D. dissertation, South. Ill. Univ.* 253p. 1981. From Diss. Abstr. Int. B Sci. Eng. 42(5):1780. Nov. 1981. SFA 27(1)

82-000016 Fouché, L.; W. Killcreas and J. Waldrop. A MICROCOMPUTER PROGRAM FOR CATFISH PRODUCTION MANAGEMENT DECISIONS. *Miss. State Univ. Dep. Agric. Econ. AEC Tech. Publ.* No. 26. 45p. July 1981. SFA 27(1)
[Miss. Agric. For. Exp. Stn., Mississippi State 39762]

82-000017 Hamman, R. L. SPAWNING AND CULTURE OF COLORADO SQUAWFISH IN RACEWAYS. *Prog. Fish-Cult.* 43(4):173-177. Oct. 1981. SFA 27(1)
[U.S. FWS, Willow Beach Natl. Fish Hatchery, P.O. Box 757, Boulder City, NV 89005]

82-000018 Kemp, A. REARING OF EMBRYOS AND LARVAE OF THE AUSTRALIAN LUNGFISH, *NEOCERATODUS FORSTERI*, UNDER LABORATORY CONDITIONS. *Copeia* 1981(4):776-784. 29 Dec. 1981. SFA 27(1)
[Queensland Mus., Fortitude Valley, Queensland 4006, Australia]

82-000019 Li, S. and G. B. Ayles. PRELIMINARY EXPERIMENTS ON GROWTH, SURVIVAL, PRODUCTION AND INTERSPECIFIC INTERACTIONS OF WALLEYE (*STIZOSTEDION VITREUM VITREUM*) FINGERLINGS IN CONSTRUCTED EARTHEN PONDS IN THE CANADIAN PRAIRIES. *Can. Tech. Rep. Fish. Aquatic Sci.* No. 1041. iv + 14p. Dec. 1981. In English with French summ. SFA 27(1)
[West Reg., Dep. Fish. Oceans, Winnipeg, MB R3T 2N6, Canada] Rearing of walleye fry and fingerlings in ponds can decrease the normally very high mortalities in larger water bodies. Subsequent release into natural waters of large fingerlings may ultimately lead to an increase of catchable fish. An experiment on extensive rearing of walleye was conducted in 4 constucted earthen ponds and 12 farm dugouts in the Canadian prairies. Growth was good: with 112-140 days of growth, walleye attained 102-164 mm with a mean of 134 mm in length and 7.5 - 32.9 g with a mean of 19.6 g in weight. Survival generally was low. The survival in 11 ponds in which fish were not killed by environmental factors ranged from 1.2 to 18% with a mean of 7.6%, and

WARMWATER CULTURE (CONTINUED)

82-000019 CONTINUED correspondingly, the production of walleye in the 11 ponds ranged from 0.5 to 36.4 kg/ha with a mean 13.3 kg/ha. Carp and minnows were also stocked in the ponds but their effects on the walleye were not significant.

82-000020 Li, S. and G. B. Ayles. AN INVESTIGATION OF FEEDING HABITS OF WALLEYE (*STIZOSTEDION VITREUM VITREUM*) FINGERLINGS IN CONSTRUCTED EARTHEN PONDS IN THE CANADIAN PRAIRIES. *Can. Tech. Rep. Fish. Aquatic Sci.* No. 1040. iv + 10p. Dec. 1981. In English with French summ. SFA 27(1)
[West. Reg., Dep. Fish. Oceans, Winnipeg, MB R3T 2N6, Canada] Stomach contents from 757 walleye (*Stizostedion vitreum vitreum*) fingerlings ranging in length from 34 to 177 mm stocked in 11 constructed ponds were analyzed. The food items found in walleye stomachs were categorized as follows: preferred - mayflies, *Chaoborus*, *Gammarus*, fish; common - crustaceans, leeches; and rare - chironomids and water boatmen. Zooplankton were heavily utilized by small fish while fish were important only for the larger fingerlings. Fullness index and feeding intensity varied with season. July-August were periods of peak feeding activities. There was a significant multiple correlation (n=17, r=0.69, $p < 0.01$; $G = -82.71 + 3.65 F_I - 0.12 K_F$) between absolute growth rate and feeding intensity and fullness index. Recommendations are made for the improvement of walleye culture by providing approximate food at approximate times.

82-000021 Seymour, E. A. THE EFFECTS OF POWDERED CARP PITUITARY ON OVARIAN DEVELOPMENT, OVARIAN ASCORBIC ACID AND OVULATION IN *CARASSIUS CARASSIUS* L. EXPOSED TO VARIOUS PHOTOPERIOD AND TEMPERATURE REGIMES. *J. Fish Biol.* 19(6):675-682. Dec. 1981. SFA 27(1)
[Appl. Ecol. Res. Group, Dep. Life Sci., Polytech. Cent. London, 115 New Cavendish St., London W1M 8JS, England]

82-000022 Singh, S. P.; J. C. Malhotra; R. N. Seth; K. P. Srivastava and K. Chandra. OBSERVATIONS ON REARING OF HATCHLINGS OF CATFISH *MYSTUS SEENGHALA* (SYKES). *Aquaculture* 26(1-2):161-166. Nov. 1981. SFA 27(1)
[Cent. Inland Fish. Res. Substn., 24 Pannalal Rd., Allahabad, U.P.-211 002, India]

MARICULTURE

82-000023 Giovanardi, O. ASPETTI DELLA MARICOLTURA IN GIAPPONE CON PARTICOLARE RIFERIMENTO ALLA PISCICOLTURA MARINA. [MARINE FIN-FISH CULTURE IN JAPAN.] *Riv. It. Piscic. Ittiop.* 16(3):70-72, 75-76. July-Sept. 1981. In Italian with English summ. SFA 27(1)
[Lab. Biol. Mar. Pesca-Viale Adriatico, 52-61 032 FANO (PS), Italy]

82-000024 Kraul, S. PRODUCTION OF LIVE FOOD FOR TROPICAL MARINE LARVAL FISHES. *Am. Assoc. Zool. Parks Aquariums Annu. Conf. Proc.* p. 110-114. 1981. SFA 27(1)
[Waikiki Aquarium, Honolulu, HI]

82-000025 Marliave, J. B. USE OF TIDAL POWER FOR CULTURE OF LARVAL MARINE ANIMALS. *Am. Assoc. Zool. Parks Aquariums Annu. Conf. Proc.* p. 103-105. 1981. SFA 27(1)
[Vancouver Publ. Aquarium, P.O. Box 3232, Vancouver, BC V6B 3X8, Canada]

MARICULTURE (CONTINUED)

82-000026 Sieswerda, P. L. THE CAPTIVE PROPAGATION OF MARINE FISH. *Am. Assoc. Zool. Parks Aquariums Annu. Conf. Proc.* p. 99-102. 1981. SFA 27(1)

82-000027 Todd, P. R. HORMONE-INDUCED MATURATION IN MALE NEW ZEALAND FRESHWATER EELS (*ANGUILLA* SPP.). *N.Z. J. Mar. Freshwater Res.* 15(3):237-246. 1981. SFA 27(1)
[Fish. Res. Div., Minist. Agric. Fish., Private Bag, Christchurch, New Zealand]

FEEDS, FEEDING, AND NUTRITION

82-000028 Grabner, M.; W. Wieser and R. Lackner. THE SUITABILITY OF FROZEN AND FREEZE-DRIED ZOOPLANKTON AS FOOD FOR FISH LARVAE: A BIOCHEMICAL TEST PROGRAM. *Aquaculture* 26(1-2):85-94. Nov. 1981. SFA 27(1)
[Inst. Zoophysiol., Univ. Innsbruck, Austria]

82-000029 Hughes, S. G.; G. L. Rumsey and J. G. Nickum. RIBOFLAVIN REQUIREMENT OF FINGERLING RAINBOW TROUT. *Prog. Fish-Cult.* 43(4):167-172. Oct. 1981. SFA 27(1)
[Iowa Coop. Fish Res. Unit, Science Hall II, Iowa State Univ., Ames 50011]

82-000030 Jürss, K. THE EFFECT OF VITAMIN B_6 DEFICIENCY ON THE FREE AMINO ACIDS AND TWO AMINOTRANSFERASES OF WHITE MUSCLE FROM *SALMO GAIRDNERI* RICHARDSON. *Comp. Biochem. Physiol. B Comp. Biochem.* 70(4):829-832. 1981. SFA 27(1)
[Dep. Biol., Subdep. Anim. Physiol., Wilhelm Pieck Univ., 25 Rostock, West Germany]

82-000031 Lemm, C. A. and M. A. Hendrix. GROWTH AND SURVIVAL OF ATLANTIC SALMON FED VARIOUS STARTER DIETS. *Prog. Fish.-Cult.* 43(4):195-199. Oct. 1981. SFA 27(1)
[U.S. FWS, Natl. Fish. Res. Dev. Lab., Wellsboro, PA 16901]

82-000032 Lin, W. L.; X. Z. Liu and J. K. Liu. DETRITUS FORMATION OF TWO PLANKTERS AND QUERY ON THE ROLE OF THEIR DETRITUS IN THE NUTRITION OF THE SILVER CARP AND BIGHEAD. *Int. Ver. Theor. Angew. Limnol. Verh.* 21(Part 2):1287-1290. 1981. SFA 27(1)
[Inst. Hydrol., Acad. Sin., Wuhan, China]

82-000033 Marliave, J. B. FROZEN FOOD, NUTRIENT DEGRADATION AND EFFECTS ON MARINE FISH. *Am. Assoc. Zool. Parks Aquariums Annu. Conf. Proc.* p. 106-109. 1981. SFA 27(1)
[Vancouver Publ. Aquarium, P.O. Box 3232, Vancouver, BC V6B 3X8, Canada]

82-000034 National Academy of Sciences. NUTRIENT REQUIREMENTS OF WARMWATER FISHES. *Natl. Acad. Sci., Washington, D.C.* vii + 78p. 1977. SFA 27(1)
[Washington, DC]

82-000035 Tacon, A. G. J. SPECULATIVE REVIEW OF POSSIBLE CAROTENOID FUNCTION IN FISH. *Prog. Fish.-Cult.* 43(4):205-208. Oct. 1981. SFA 27(1)
[Inst. Aquacult., Univ. Stirling, Stirling FK9 4LA, Scotland]

FEEDS, FEEDING, AND NUTRITION (CONTINUED)

82-000036 Viola, S.; U. Rappaport; Y. Arieli; G. Amidan and S. Mokady. THE EFFECTS OF OIL-COATED PELLETS ON CARP (*CYPRINUS CARPIO*) IN INTENSIVE CULTURE. *Aquaculture* 26(1-2):49-65. Nov. 1981. SFA 27(1)
[Isr. Feedmills Assoc., Beitan Aharon, Doar Kfar Witkin, Israel] A pelleted basal ration of 25% protein was spray-coated with oils of different origin -plant, chicken or fish, and fed to carp in experimental ponds and cages for 4-7 weeks. Acid oils and neutral oils were utilized equally well, except crude cottonseed oil. Carp grew normally on less than 0.5%ω:3 fatty acids. Five percent oils increased yields in cages by 30-50%, and in ponds by 18%. Feed conversions were improved proportionally. Oiled pellets maintained growth rates and feed conversions at twice the stocking rate of the standard pellets. Protein retention and energy retention were increased; the marginal retention of energy due to the added oil exceeded 100% in several trials (increment of retained energy due to added oil ÷ increment of energy due to feed). The fat content of the carp was raised by 2% on average. The pattern of the body fatty acids tended to change in direction of the dietary oils, i.e. toward higher unsaturation.

82-000037 Yamanda, S.; Y. Tanaka and T. Katayama. FEEDING EXPERIMENTS WITH CARP FRY FED AN AMINO ACID DIET BY INCREASING THE NUMBER OF FEEDINGS PER DAY. *Bull. Jpn. Soc. Sci. Fish.* 47(9):1247. Sept. 1981. SFA 27(1)
[Lab. Mar. Biochem., Fac. Fish., Kagoshima Univ., 50-20 Shimoarata-4, Kagoshima 890, Japan]

TRANSPORTING FISH

82-000038 Farwell, C. J. AIR SHIPMENT OF MARINE ORGANISMS--SHORT-TERM PROBLEMS WITH LONG-TERM AFTEREFFECTS. *Am. Assoc. Zool. Parks Aquariums Annu. Conf. Proc.* p. 82-85. 1981. SFA 27(1)
[Scripps Aquarium-Mus., La Jolla, CA]

82-000039 Hamman, R. L. TRANSPORTING ENDANGERED FISH SPECIES IN PLASTIC BAGS. *Prog. Fish.-Cult.* 43(4):212-213. Oct. 1981. SFA 27(1)
[U.S. Fish Wildl. Serv., Willow Beach Natl. Fish Hatchery, P.O. Box 757, Boulder City, NV 89005]

GENERAL LIMNOLOGY AND OCEANOGRAPHY

82-000040 Daley, R. J.; E. C. Carmack; C. B. J. Gray; C. H. Pharo; S. Jasper and R. C. Wiegand. THE EFFECTS OF UPSTREAM IMPOUNDMENTS ON THE LIMNOLOGY OF KOOTENAY LAKE, B.C. *Can. Natl. Water Res. Inst. Sci. Ser.* No. 117. xv + 98p. 1981. In English with French summ. SFA 27(1)
[Natl. Water Res. Inst., Inland Waters Dir., Vancouver, BC, Canada]

CHEMICAL LIMNOLOGY AND OCEANOGRAPHY

82-000041 Keen, W. H. and J. Gagliardi. EFFECT OF BROWN BULLHEADS ON RELEASE OF PHOSPHORUS IN SEDIMENT AND WATER SYSTEMS. *Prog. Fish-Cult.* 43(4):183-185. Oct. 1981. SFA 27(1)
[Dep. Biol. Sci., State Univ. N.Y., College at Cortland, Cortland 13045]

BENTHOS

82-000042 Reice, S. R. INTERSPECIFIC ASSOCIATIONS IN A WOODLAND STREAM. *Can. J. Fish. Aquatic Sci.* 38(10):1271-1280. Oct. 1981. In English with French summ. SFA 27(1)
[Dep. Zool., Univ. N.C., Chapel Hill 27514]

PLANKTON

82-000043 Chien, Y.-H. and J. W. Avault, Jr. THREE-DIMENSIONAL PERIPHYTON SAMPLER FOR USE IN LENTIC WATERS. *Prog. Fish.-Cult.* 43(4):216-217. Oct. 1981. SFA 27(1)
[Cent. Wetland Resour., La. State Univ., Baton Rouge 70803]

MORPHOLOGY

82-000044 Blaber, S. J. M.; D. P. Cyrus and A. K. Whitfield. THE INFLUENCE OF ZOOPLANKTON FOOD RESOURCES ON THE MORPHOLOGY OF THE ESTUARINE CLUPEID *GILCHRISTELLA AESTUARIUS* (GILCHRIST, 1914). *Environ. Biol. Fishes* 6(3-4):351-355. 1 Nov. 1981. SFA 27(1)
[Zool. Dep., Univ. Natal, P.O. Box 375, Pietermaritzburg 3200, Natal, South Africa]

82-000045 Blouw, D. M. and D. W. Hagen. ECOLOGY OF THE FOURSPINE STICKLEBACK, *APELTES QUADRACUS*, WITH RESPECT TO A POLYMORPHISM FOR DORSAL SPINE NUMBER. *Can. J. Zool.* 59(9):1677-1692. Sept. 1981. In English with French summ. SFA 27(1)
[Dep. Biol., Univ. New Brunswick, Bag Serv. No. 45111, Fredericton, NB E3B 6E1, Canada]

82-000046 Dunn, J. F.; W. Davison; G. M. O. Maloiy; P. W. Hochachka and M. Guppy. AN ULTRASTRUCTURAL AND HISTOCHEMICAL STUDY OF THE AXIAL MUSCULATURE IN THE AFRICAN LUNGFISH. *Cell Tissue Res.* 220(3):599-609. Oct. 1981. SFA 27(1)
[Dep. Zool., Univ. British Columbia, Vancouver, BC, Canada]

82-000047 Elston, R.; L. Corazza and J. G. Nickum. MORPHOLOGY AND DEVELOPMENT OF THE OLFACTORY ORGAN IN LARVAL WALLEYE, *STIZOSTEDION VITREUM*. *Copeia* 1981(4):890-893. 29 Dec. 1981. SFA 27(1)
[Dep. Avian Aquatic Anim. Med., N.Y. State Coll. Vet. Med., Cornell Univ., Ithaca 14853]

82-000048 Ezeasor, D. N. THE FINE STRUCTURE OF THE GASTRIC EPITHELIUM OF THE RAINBOW TROUT, *SALMO GAIRDNERI*, RICHARDSON. *J. Fish Biol.* 19(6):611-627. Dec. 1981. SFA 27(1)
[Dep. Vet. Anat., Univ. Nigeria, Nsukka, Nigeria]

82-000049 Ferri, S. and A. Sesso. ULTRASTRUCTURAL STUDY OF KUPFFER CELLS IN TELEOST LIVER UNDER NORMAL AND EXPERIMENTAL CONDITIONS. *Cell Tissue Res.* 220(2):387-391. Oct. 1981. SFA 27(1)
[Dep. Histol., Inst. Cienc. Biomed., Univ. São Paulo, Brasil]

MORPHOLOGY (CONTINUED)

82-000050 Francis, M. P. MERISTIC AND MORPHOMETRIC VARIATION IN THE LANCET FISH, *ALEPISAURUS*, WITH NOTES ON THE DISTRIBUTION OF *A. FEROX* AND *A. BREVIROSTRIS*. *N.Z. J. Zool.* 8(3):403-408. 1981. SFA 27(1)
[Fish Res. Div., Minist. Agric. Fish., P.O. Box 297, Wellington, New Zealand]

82-000051 Grier, H. J.; J. R. Burns and J. A. Flores. TESTIS STRUCTURE IN THREE SPECIES OF TELEOSTS WITH TUBULAR GONOPODIA. *Copeia* 1981(4):797-801. 29 Dec. 1981. SFA 27(1)
[Dep. Biol., Univ. South Fla., Tampa 33620]

82-000052 Grimes, P. J. and D. A. Robertson. EGG AND LARVAL DEVELOPMENT OF THE SILVER WAREHOU, *SERIOLELLA PUNCTATA* (PISCES: CENTROLOPHIDAE). *N.Z. J. Mar. Freshwater Res.* 15(3):261-266. 1981. SFA 27(1)
[Fish. Res. Div., Minist. Agric. Fish., P.O. Box 297, Wellington, New Zealand]

82-000053 Hamilton, S. J.; P. M. Mehrle; F. L. Mayer and J. R. Jones. METHOD TO EVALUATE MECHANICAL PROPERTIES OF BONE IN FISH. *Trans. Am. Fish. Soc.* 110(6):708-717. Nov. 1981. SFA 27(1)
[U.S. FWS, Columbia Natl. Fish. Res. Lab., Rt. 1, Columbia, MO 65201]

82-000054 Holt, J.; A. G. Johnson; C. R. Arnold; W. A. Fable, Jr. and T. D. Williams. DESCRIPTION OF EGGS AND LARVAE OF LABORATORY REARED RED DRUM, *SCIAENOPS OCELLATA*. *Copeia* 1981(4):751-756. 29 Dec. 1981. SFA 27(1)
[Univ. Tex. Mar. Sci. Inst., Port Aransas Mar. Lab., Port Aransas 78373]

82-000055 Ito, S. and J. A. C. Nicol. GUANINE IN THE TAPETUM LUCIDUM OF THE LADYFISH, *ELOPS SAURUS* LINNAEUS. *Contrib. Mar. Sci.* 24:9-12. Sept. 1981. SFA 27(1)
[Inst. Comp. Med. Sci., Fujita-Gakuen Univ., Sch. Med., Toyoake, Aichi, 470-11, Japan]

82-000056 Jirásek, J.; A. Hampl and D. Sirotek. GROWTH MORPHOLOGY OF THE FILTERING APPARATUS OF SILVER CARP (*HYPOPHTHALMICHTHYS MOLITRIX*) I. GROSS ANATOMY STATE. *Aquaculture* 26(1-2):41-48. Nov. 1981. SFA 27(1)
[Dep. Fish. Water Prot., Fac. Agron., Univ. Agric., Brno, Czechoslovakia]

82-000057 Krajnović-Ozretić, M. and R. Žikić. ANALYSIS OF VERTEBRAL NUMBER OF THE SARDINE (*SARDINA PILCHARDUS* [WALB.]) FROM THE ADRIATIC SEA. *Thalassia Jugosl.* 14(3-4):313-321. 1978. SFA 27(1)
[Cent. Mar. Res., Ruder Bošković Inst., Rovinji, Yugoslavia]

82-000058 Kux, Z. and J. Libosvárský. VARIABLE MORPHOLOGICAL CHARACTERS OF *GOBIO GOBIO* (CYPRINIDAE) EXAMINED BY PRINCIPAL COMPONENT ANALYSIS. *Folia Zool.* 30(3):229-240. 1981. In English with Russian summ. SFA 27(1)
[Zool. Dep., Moravian Mus., Brno, Czechoslovakia]

82-000059 Lang, I. ELECTRON MICROSCOPIC AND HISTOCHEMICAL INVESTIGATIONS OF THE ATRETIC OOCYTE OF *PERCA FLUVIATILIS* L. (TELEOSTEI). *Cell Tissue Res.* 220(1):201-212. Sept. 1981. SFA 27(1)
[Zool. Inst., Univ. Göttingen, West Germany]

MORPHOLOGY (CONTINUED)

82-000060 Lauder, G. V. and K. F. Liem. PREY CAPTURE BY *LUCIOCEPHALUS PULCHER*: IMPLICATIONS FOR MODELS OF JAW PROTRUSION IN TELEOST FISHES. *Environ. Biol. Fishes* 6(3-4):257-268. 1 Nov. 1981. SFA 27(1)
[Dep. Anat., Univ. Chicago, 1025 E. 57th St., Chicago, IL 60637]

82-000061 Leknes, I. L. and T. S. Sætersdal. ON THE ULTRASTRUCTURE OF SPECIFIC HEART GRANULES IN TELEOSTS. *J. Fish Biol.* 19(5):575-579. Nov. 1981. SFA 27(1)
[Cell. Cardiol. Res. Group, Inst. Anat., Univ. Bergen, Årstadveien 19, N-5000 Bergen, Norway]

82-000062 Lethbridge, R. C. and I. C. Potter. THE DEVELOPMENT OF TEETH AND ASSOCIATED FEEDING STRUCTURES DURING THE METAMORPHOSIS OF THE LAMPREY, *GEOTRIA AUSTRALIS*. *Acta Zool. (Stockh.)* 62(4):201-214. 1981. SFA 27(1)
[Sch. Environ. Life Sci., Murdoch Univ., Western Australia 6150, Australia]

82-000063 Libosvárský, J. and O. Štěrba. REGRESSIVE PROCESSES IN THE OOCYTES OF THREE CYPRINIDS WITH INTERMITTENT SPAWNING. *Folia Zool.* 30(3):241-248. 1981. In English with Russian summ. SFA 27(1)
[Inst. Vert. Zool., Czech. Acad. Sci., Brno, Czechoslovakia]

82-000064 Litvinenko, N. I. THE STRUCTURE, FUNCTION AND ORIGIN OF THE DRUMMING MUSCLES IN THE NORTH ATLANTIC OCEAN PERCHES OF THE GENUS *SEBASTES* (SCORPAENIDAE). *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):89-98. 1980. SFA 27(1)
[Dep. Invert. Zool., Perm Univ., USSR]

82-000065 Makeyeva, A. P. EARLY ONTOGENETIC CHARACTERISTICS OF THE BIGMOUTH BUFFALO, *ICTIOBUS CYPRINELLA* (CATOSTOMIDAE). *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):73-89. 1980. SFA 27(1)
[Dep. Ichthyol., Moscow Univ., USSR]

82-000066 McCune, A. R. QUANTITATIVE DESCRIPTION OF BODY FORM IN FISHES: IMPLICATIONS FOR SPECIES LEVEL TAXONOMY AND ECOLOGICAL INFERENCE. *Copeia* 1981(4):897-901. 29 Dec. 1981. SFA 27(1)
[Dep. Biol., Yale Univ., New Haven, CT 06520]

82-000067 Meunier, F. J. and M. Pascal. ETUDE EXPERIMENTALE DE LA CROISSANCE CYCLIQUE DES RAYONS DE NAGEOIRE DE LA CARPE (*CYPRINUS CARPIO* L.). RESULTATS PRELIMINAIRES. [EXPERIMENTAL STUDY OF CYCLICAL GROWTH IN FIN RAYS OF CARP (*CYPRINUS CARPIO* L.). PRELIMINARY RESULTS.] *Aquaculture* 26(1-2):23-40. Nov. 1981. In French with English summ. SFA 27(1)
[Lab. Anat. Comp., 2, Place Jussieu, 75251 Paris cedex 05, France]

82-000068 Moser, H. G. and J. L. Butler. DESCRIPTION OF REARED LARVAE AND EARLY JUVENILES OF THE CALICO ROCKFISH, *SEBASTES DALLII*. *Calif. Coop. Oceanic Fish. Invest. Rep.* 22:88-95. Oct. 1981. SFA 27(1)
[NMFS, Southwest Fish. Cent., La Jolla, CA 92038]

82-000069 Oguri, M. ON THE RECTAL GLAND WEIGHT OF SOME ELASMOBRANCHS. *Bull. Jpn. Soc. Sci. Fish.* 47(8):1019-1021. Aug. 1981. SFA 27(1)
[Fish. Lab., Fac. Agric., Nagoya Univ., Chikusa-ku, Nagoya 464, Japan]

MORPHOLOGY (CONTINUED)

82-000070 Olmsted, L. L.; B. L. Sill and R. E. Lewis. AN EVALUATION OF METHODS FOR ESTIMATING SURFACE AREAS OF FRESHWATER FISHES. *Duke Power Co.* DUKEPWR/80-03. 14p. May 1980. SFA 27(1)
[Duke Power Co., Charlotte, NC] Available techniques for estimating surface areas of fishes are reviewed and compared with regard to accuracy, ease of calculation, and time constraints. For most ecological studies there is little justification for direct determination of surface areas. Satisfactory estimates (generally ±5%) can be gained through simple manipulations involving measurements of only total length, standard length, and girth.

82-000071 Rafn, S. and K. G. Wingstrand. STRUCTURE OF INTESTINE, PANCREAS, AND SPLEEN OF THE AUSTRALIAN LUNGFISH, *NEOCERATODUS FORSTERI* (KREFFT). *Zool. Scr.* 10(3):223-239. 1981. SFA 27(1)
[Kirkastræde 8, DK-5600 Fåborg, Denmark]

82-000072 Rudometkina, G. P. LARVAL *GONOSTOMA ATLANTICUM* (GONOSTOMATIDAE) FROM THE TROPICAL ATLANTIC. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):150-152. 1980. SFA 27(1)
[AtlantNIRO, Kaliningrad, USSR]

82-000073 Schweigert, J. F. PATTERN RECOGNITION OF MORPHOMETRIC AND MERISTIC CHARACTERS AS A BASIS OF HERRING STOCK IDENTIFICATION. *Can. Tech. Rep. Fish. Aquatic Sci.* No. 1021. iii + 13p. Aug. 1981. In English with French summ. SFA 27(1)
[Dep. Fish Oceans, Pac. Biol. Stn., Nanaimo, BC V9R 5K6, Canada] Pattern recognition was used to examine the utility of 5 morphometric and 4 meristic characters as potential discriminators among three west coast herring stocks. Morphometric characters accounted for most of the variation in the data and separated 98 percent of Departure Bay fish from the other two groups. Meristic characters contributed a smaller amount of additional information that aided in the separation of Point Grey and San Francisco Bay fish. Overall, about 67 percent of all fish could be correctly classified as to their area of origin based on morphometric characters alone.

82-000074 Senn, D. G. MORPHOLOGY OF THE HYPOTHALAMUS IN ADVANCED TELEOST FISHES. *Zool. J. Linn. Soc.* 73(4):343-350. Dec. 1981. SFA 27(1)
[Zool. Inst., Rheinsprung 9, CH-405 1 Basel, Switzerland]

82-000075 Sideleva, V. G. STRUCTURAL FEATURES OF THE SEISMOSENSORY SYSTEM OF FRESHWATER SCULPINS AND BAIKAL OIL-FISH (COTTIDAE AND COMEPHORIDAE) IN CONNECTION WITH A PELAGIC MODE OF LIFE. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):119-124. 1980. SFA 27(1)
[Limnol. Inst., Siberian Dep., USSR Acad. Sci., Listvenichnoye on Baikal, USSR] Comparisons are made in the structural features of the seismosensory system, external morphological characters and biology between the coastal-pelagic Baikal sculpins (Cottidae, Cottocomephorinae) and of the truly pelagic Baikal oil-fishes (Comephoridae), on one had and the typical sculpins (Cottidae, Cottinae) leading a benthic mode of life on the other. The high specialization of Baikal oil-fishes for a pelagic existence is noted.

82-000076 Suzuki, K.; S. Hioki; K. Kobayashi and Y. Tanaka. [DEVELOPING EGGS AND EARLY LARVAE OF THE WRASSES, *CIRRHILABRUS TEMMINCKII* AND *LABROIDES DIMIDIATUS*, WITH A NOTE ON THEIR SPAWNING BEHAVIORS.] *J. Fac. Mar. Sci. Technol. Tokai Univ.* No. 14. p. 369-370. 1981. In Japanese with English summ. SFA 27(1)
[Fac. Mar. Sci. Technol., Tokai Univ., Shimizu, Japan 424]

MORPHOLOGY (CONTINUED)

82-000077 Teshima, K. EPITHELIAL CELLS OF THE DUCTUS VITELLOINTESTINALIS IN THE *MUSTELUS GRISEUS* EMBRYO. *Bull. Jpn. Soc. Sci. Fish.* 47(9):1149-1152. Sept. 1981. SFA 27(1)
[Far Seas Fish. Res. Lab., 1000 Orido, Shimizu 424, Japan]

82-000078 Voskovoynikova, O. S. THE VISCERAL SKELETON OF MEMBERS OF THE GENUS *TREMATOMUS* BOULENGER (NOTOTHENIIDAE). *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):82-88. 1980. SFA 27(1)
[Zool. Inst., USSR Acad. Sci., Leningrad, USSR]

82-000079 Vyshegorodtsev, V. A. SEXUAL DIMORPHISM AND SIZE-AGE VARIATIONS IN SYSTEMATIC CHARACTERS OF WALLEYE POLLOCK, *THERAGRA CHALCOGRAMMA*, ALONG THE SOUTHWESTERN SHORES OF KAMCHATKA. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):50-53. 1980. SFA 27(1)
[MoTINRO, Magadan, USSR]

82-000080 Yoshioka, T.; S. Ono and A. Nagai. ULTRASTRUCTURE OF THE STRIATED MUSCLE OF LANCETFISH *ALEPISAURUS FEROX*. *Bull. Jpn. Soc. Sci. Fish.* 47(8):1009-1017. Aug. 1981. SFA 27(1)
[Dep. Physiol., Tokai Univ., Sch. Med., Isehara 259-11, Japan]

82-000081 Yoshizaki, K. A MORPHOLOGICAL STUDY ON THE MELANOPHORES OF TWO MORMYRID FISH, *MARCUSENIUS ISIDORI* AND *M. LONGIANALIS*. *Bull. Jpn. Soc. Sci. Fish.* 47(9):1185-1192. Sept. 1981. SFA 27(1)
[Fish. Lab., Fac. Agric., Nagoya Univ., Chikusa, Nagoya 464, Japan]

PHYSIOLOGY

82-000082 Al-Habbib, O. A. M. ACCLIMATION TO TEMPERATURE AND DEATH AT CHANGING LETHAL TEMPERATURES IN THE FRESHWATER FISH *CHALCALBURNUS CHALCOIDES*. *J. Therm. Biol.* 6(4):365-371. Oct. 1981. SFA 27(1)
[Dep. Biol., Coll. Sci., Univ. Mosul, Mosul, Iraq]

82-000083 Amirkhanov, G. A. DYNAMICS OF FREE AMINO ACIDS DURING THE LARVAL DEVELOPMENT OF THE SEVRYUGA, *ACIPENSER STELLATUS*. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):116-121. 1980. SFA 27(1)
[Dagestan Pedagogic Inst., Makhachkala, USSR]

82-000084 Barus, V.; J. Libosvárský and F. Guerra Padrón. OBSERVATIONS ON *QUINTANA ATRIZONA* (POECILIIDAE) FROM CUBA, REARED IN AQUARIA. *Folia Zool.* 30(3):203-214. 1981. In English with Russian summ. SFA 27(1)
[Inst. Vert. Zool., Czech. Acad. Sci., Brno, Czechoslovakia]

82-000085 Bielek, E. DEVELOPMENTAL STAGES AND LOCALIZATION OF PEROXIDATIC ACTIVITY IN THE LEUCOYCTES OF THREE TELEOST SPECIES (*CYPRINUS CARPIO* L.; *TINCA TINCA* L.; *SALMO GAIRDNERI* RICHARDSON). *Cell Tissue Res.* 220(1):163-180. Sept. 1981. SFA 27(1)
[Histol-Embryol. Inst., Univ. Wien, Schwarzspanierstr. 17, A-1090 Wien, Austria]

PHYSIOLOGY (CONTINUED)

82-000086 Billard, R. THE REPRODUCTIVE CYCLE IN TELEOST FISH. *Riv. It. Piscic. Ittiop.* 16(3):79-80, 82, 85. July-Sept. 1981. In English and Italian. SFA 27(1)
[Lab. Physiol. Poissons, I.N.R.A., 78350 Jouy-en-Josas, France]

82-000087 Bird, D. J. and I. C. Potter. PROXIMATE BODY COMPOSITION OF THE LARVAL, METAMORPHOSING AND DOWNSTREAM MIGRANT STAGES IN THE LIFE CYCLE OF THE SOUTHERN HEMISPHERE LAMPREY, *GEOTRIA AUSTRALIS*. *Environ. Biol. Fishes* 6(3-4):285-297. 1 Nov. 1981. SFA 27(1)
[Sch. Environ. Life Sci., Murdoch Univ., Murdoch, Western Australia 6150, Australia]

82-000088 Butskaya, N. A. THE ROLE OF TEMPERATURE AND PHOTOPERIOD IN THE SEXUAL CYCLE OF THE RUFFE, *ACERINA CERNUA* (PERCIDAE). *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):73-81. 1980. SFA 27(1)
[Lab. Fish Ecol., Biol. Res. Inst., Leningrad Univ., USSR]

82-000089 Campagna, C. G. and J. J. Cech, Jr. GILL VENTILATION AND RESPIRATORY EFFICIENCY OF SACRAMENTO BLACKFISH, *ORTHODON MICROLEPIDOTUS* AYRES, IN HYPOXIC ENVIRONMENTS. *J. Fish Biol.* 19(5):581-591. Nov. 1981. SFA 27(1)
[Wildl. Fish. Biol., Univ. Calif., Davis 95616]

82-000090 Castledine, A. J. and J. T. Buckley. INCORPORATION AND TURNOVER OF ESSENTIAL FATTY ACIDS IN PHOSPHOLIPIDS AND NEUTRAL LIPIDS OF RAINBOW TROUT. *Comp. Biochem. Physiol. B Comp. Biochem.* 71(1):119-126. 1982. SFA 27(1)
[Dep. Biochem. Microbiol., Univ. Victoria, Victoria, BC V8W 2Y2, Canada]

82-000091 Cole, W. C. and J. H. Youson. THE EFFECT OF PINEALECTOMY, CONTINUOUS LIGHT, AND CONTINUOUS DARKNESS ON METAMORPHOSIS OF ANADROMOUS SEA LAMPREYS, *PETROMYZON MARINUS* L. *J. Exp. Zool.* 218(3):397-404. Dec. 1981. SFA 27(1)
[Dep. Zool., Univ. Toronto, West Hill, ON M1C 1A4, Canada]

82-000092 Coleman, F. PROTOGYNOUS HERMAPHRODITISM IN THE ANTHIINE SERRANID FISH *HOLANTHIAS MARTINICENSIS*. *Copeia* 1981(4):893-895. 29 Dec. 1981. SFA 27(1)
[Grice Mar. Biol. Lab., Coll. Charleston, 205 Fort Johnson, Charleston, SC 29412]

82-000093 Davis, R. E.; R. Chase; J. Morris and B. Kaufman. TELENCEPHALON OF THE TELEOST *MACROPODUS*: EXPERIMENTAL LOCALIZATION OF SECONDARY OLFACTORY AREAS AND OF COMPONENTS OF THE LATERAL FOREBRAIN BUNDLE. *Behav. Neural Biol.* 33(3):257-279. Nov. 1981. SFA 27(1)
[Mental Health Res. Inst., Univ. Mich., Ann Arbor 48109]

82-000094 Djabali, M.; P. Payan; J.-P. Girard and P. Pic. MISE EN ÉVIDENCE DE RÉCEPTEURS β ADRÉNERGIQUES DANS LES CELLULES DE L'ÉPITHÉLIUM BRANCHIAL DE TRUITE (*SALMO GAIRDNERI*) ADAPTÉE À L'EAU DE MER. [EVIDENCE FOR β ADRENOCEPTORS IN THE EPTHELIAL ISOLATED CELLS OF THE RAINBOW TROUT ADAPTED TO SEA WATER.] *C.R. Hebd. Seances Acad. Sci. Ser. III Sci. Vie* 293(6):333-336. 19 Oct. 1981.

PHYSIOLOGY (CONTINUED)

82-000094 CONTINUED SFA 27(1)
[Stn. Mar. d'Endoume, rue Batterie-des-Lions, 13007 Marseille, France]

82-000095 Eales, J. G. EXTRATHYROIDAL EFFECTS OF LOW CONCENTRATIONS OF THIOUREA ON RAINBOW TROUT, *SALMO GAIRDNERI*. *Can. J. Fish Aquatic Sci.* 38(10):1283-1285. Oct. 1981. In English with French summ. SFA 27(1)
[Dep. Zool., Univ. Manitoba, Winnipeg, MB R3T 2N2, Canada]

82-000096 Edwards, T. W. THE ASSIMILATION EFFICIENCY OF *CEBIDICHTHYS VIOLACEUS* (FAMILY: STICHAEIDAE), A HERBIVOROUS FISH FROM THE ROCKY INTERTIDAL ZONE OF CENTRAL CALIFORNIA. *M.A. thesis, Calif. State Univ.* 86p. 1981. From Masters Abstr. 19(4):287. Dec. 1981. SFA 27(1)
The diet of the monkeyface prickleback, *Cebidichthys violaceus*, from the rocky intertidal zone of central California (vicinity of Piedras Blancas, 35° 40'N, 121° 17'W) is comprised almost entirely of red and green algae once the fish reaches a size of 60mm standard length. During the summer of 1978 the algae *Ulva lobata* and *Spongomorpha coalita* (Chlorophyta) and *Porphyra perforata* and *Iridaea flaccida* (Rhodophyta) comprised, on a dry weight basis, 77.1% of the diet of *Cebidichthys violaceus*. The capacity of the fish to assimilate nutrients from these algae was measured by comparing a nutrient in the fish's food and feces with the amount of ash in the dietary item. Depending on the food item, *Cebidichthys violaceus* can assimilate 30 to 50% of the alga's total nutrient content, 40 to 80% of the protein, 20 to 40% of the lipid, 25 to 60% of the carbohydrates and 30 to 64% of the energy. *Cebidichthys violaceus* is the first marine fish from temperate latitudes which has been conclusively shown to assimilate algal nutrients.

82-000097 Elger, M. and H. Hentschel. THE GLOMERULUS OF A STENOHALINE FRESH-WATER TELEOST, *CARASSIUS AURATUS GIBELIO*, ADAPTED TO SALINE WATER. A SCANNING AND TRANSMISSION ELECTRON-MICROSCOPIC STUDY. *Cell Tissue Res.* 220(1):73-85. Sept. 1981. SFA 27(1)
[Zool. Inst., Tier. Hochsch., Bischofsholer Damm 15, D-3000 Hannover 1, West Germany]

82-000098 Ellis, M. J. and J. J. Poluhowich. BILIVERDIN CONCENTRATIONS IN THE PLASMAS OF FRESH AND BRACKISH WATER EELS, *ANGUILLA ROSTRATA*. *Comp. Biochem. Physiol. A Comp. Physiol.* 70(4):587-589. 1981. SFA 27(1)
[Inst. Anguilliform Res. Maricult., Univ. Bridgeport, Bridgeport, CT 06602]

82-000099 Fable, W. A., Jr.; H. A. Brusher; L. Trent and J. Finnegan, Jr. POSSIBLE TEMPERATURE EFFECTS ON CHARTER BOAT CATCHES OF KING MACKEREL AND OTHER COASTAL PELAGIC SPECIES IN NORTHWEST FLORIDA. *Mar. Fish. Rev.* 43(8):21-26. Aug. 1981. SFA 27(1)
[NMFS, 3500 Delwood Beach Rd., Panama City, FL 32407]

82-000100 Favaretto, A. L. V.; S. O. Petenusci; R. A. Lopes and P. Sawaya. EFFECT OF EXPOSURE TO AIR ON HAEMATOLOGICAL PARAMETERS IN *HYPOSTOMUS REGANI* (PISCES: LORICARIIDAE), TELEOST WITH AQUATIC AND AERIAL RESPIRATION. I. RED CELLS. *Copeia* 1981(4):918-920. 29 Dec. 1981. SFA 27(1)
[Fac. Farm. Odontol. Ribeirão Preto, Univ. São Paulo, 14100 Ribeirão Preto-SP-Brazil]

82-000101 Frankel, J. S. ALCOHOL DEHYDROGENASE ONTOGENY AND LIVER MATURATION IN THE LEOPARD DANIO, *BRACHYDANIO NIGROFASCIATUS*. *Comp. Biochem. Physiol. B Comp. Biochem.* 70(3):643-644. 1981. SFA 27(1)
[Dep. Zool., Howard Univ., Washington, DC 20059]

PHYSIOLOGY (CONTINUED)

82-000102 Girsa, I. I.; V. N. Zhuravel' and Yu. Ye. Lapin. SALINITY PREFERENCES OF JUVENILE WHITEFISH, *COREGONUS LAVARETUS*, CISCO, *COREGONUS SARDINELLA MARISALBI*, AND THE PINK SALMON, *ONCORHYNCHUS GORBUSCHA*, FROM THE WHITE SEA BASIN. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):138-148. 1980. SFA 27(1)

[IEMEZH, Moscow, USSR] Experiments carried out in a salinity gradient with juvenile whitefish, *Coregonus lavaretus* 8-24 mm, cisco, *C. sardinella marisalbi*, 17-25mm and pink salmon, *Oncorhynchus gorbuscha*, 46-56mm demonstrate that during the period of downstream migration the whitefish (from 11mm) shows a preference for sea water with a salinity of 20°/oo; the cisco behaves negatively towards water with a heightened salinity, preferring fresh water, but it survives at a salinity of 13 and 8°/oo; after its downstream migration to the sea, during the period of growth in estuaries and, the pink salmon selects freshened water. The positive reaction of the whitefish to salinity in the early stages of ontogeny is considered as an adaptation to possible entry into sea water, because downstream migration is encountered in the whitefish in all stages of the larval and fingerling periods of development, depending on the nature of the discharge of the fresh water. For the pink salmon freshened water probably acts as a sign of favorable growing conditions and it is also an orientation factor in the environment.

82-000103 Goncharov, B. F. and A. A. Kuznetsov. DIFFERENCES IN BIOLOGICAL EFFECT OF ISOFORMS OF GONADOTROPIC HORMONE FROM THE STURGEON (*ACIPENSER STELLATUS* PALL.) AND IDENTITY OF THEIR SPECTRA IN HYPOPHYSES OF MALES AND FEMALES. *Dokl. Biol. Sci. (Engl. Transl. Dokl. Acad. Nauk SSSR Ser. Biol.)* 258(1-6):312-315. Nov. 1981. SFA 27(1)

[N.K. Kol'tsov Inst. Dev. Biol., Acad. Sci. USSR, Moscow, USSR]

82-000104 Hamilton, S. J.; P. M. Mehrle; F. L. Mayer and J. R. Jones. MECHANICAL PROPERTIES OF BONE IN CHANNEL CATFISH AS AFFECTED BY VITAMIN C AND TOXAPHENE. *Trans. Am. Fish. Soc.* 110(6):718-724. Nov. 1981. SFA 27(1)

[U.S. FWS, Columbia Natl. Fish. Res. Lab., Rt. 1, Columbia, MO 65201]

82-000105 Hansen, H. O. and J. Knudsen. THE INFLUENCE OF ENVIRONMENTAL AND INCUBATION TEMPERATURE ON FATTY ACID SYNTHETASE FROM FLOUNDER (*PLATICHTHYS FLESUS* L.) LIVER. *Comp. Biochem. Physiol. B Comp. Biochem.* 70(3):515-520. 1981. SFA 27(1)

[Inst. Biochem., Odense Univ., Campusvej 55, 5230 Odense M, Denmark]

82-000106 Hew, C. L.; D. Slaughter; G. L. Fletcher and S. B. Joshi. ANTIFREEZE GLYCOPROTEINS IN THE PLASMA OF NEWFOUNDLAND ATLANTIC COD (*GADUS MORHUA*). *Can. J. Zool.* 59(11):2186-2192. Nov. 1981. In English with French summ. SFA 27(1)

[Dep. Biochem., Memorial Univ. Newfoundland, St. John's, NF A1B 3X9, Canada]

82-000107 Hodson, R. G.; R. G. Fechhelm and R. J. Monroe. UPPER TEMPERATURE TOLERANCE OF SPOT, *LEIOSTOMUS XANTHURUS*, FROM THE CAPE FEAR RIVER ESTUARY, NORTH CAROLINA. *Estuaries* 4(4):345-356. Dec. 1981. SFA 27(1)

[Dep. Zool., N.C. State Univ., Raleigh 27650] The temperature tolerance and resistance times of postlarval (<25mmSL) and small juvenile spot, *Leiostomus xanthurus*, from the Cape Fear Estuary, North Carolina were tested in the laboratory. Critical thermal maximum techniques were used to determine first equilibrium loss (FEL) and critical thermal maximum (CTM)

PHYSIOLOGY (CONTINUED)

82-000107 CONTINUED ends points and thermal shock methods were used to determine 96-h upper incipient lethal temperatures (LT_{50}). Acclimation temperatures ranged from 10 to 35°C and acclimation salinities were 10, 20 and 30°/oo. A quadratic model was fit to the CTM and FEL data; r^2 values were 0.924 and 0.928 respectively. Acclimation salinity, estimated weight, acclimation salinity by acclimation temperature interaction and acclimation temperature by estimated weight interaction were the significant components of the CTM model. Predicted CTM values ranged from 30°C at 10°C and 30°/oo acclimation to just over 40°C at 30°C and 30°/oo acclimation. Acclimation temperature, acclimation temperature squared, estimated weight and acclimation temperatures by estimated weight interaction were the significant components of the FEL model. Predicted FEL values ranged from around 28°C at 10°C and 10°/oo acclimation to about 39°C at 30°C and 30°/oo acclimation. The 96-h LT_{50} values of spot acclimated to 20°/oo increased linearly with acclimation temperature to 25°C. From about 25 to 35°C, LT_{50} values increased very little with acclimation temperature. The ultimate upper incipient lethal temperature of postlarval and small juvenile spot was estimated at 35.2°C. Increased salinity increased resistance time but decreased LT_{50} estimates. Thermal shock tests were better for predicting the effects of thermal addition than were CTM tests.

82-000108 Hogendoorn, H.; F. Van Korlaar and H. Bosch. AN OPEN CIRCUIT BALANCE RESPIROMETER FOR BIOENERGETIC STUDIES OF FISH GROWTH. *Aquaculture* 26(1-2):183-187. Nov. 1981. SFA 27(1)
[Agric. Univ., Dep. Fish Cult. Inland Fish., P.O. Box 338, Wageningen, Netherlands]

82-000109 Jankowsky, H. D.; W. Hotopp and P. Vsiansky. EFFECTS OF ASSAY AND ACCLIMATION TEMPERATURES ON INCORPORATION OF AMINO ACIDS INTO PROTEIN OF ISOLATED HEPATOCYTES FROM THE EUROPEAN EEL, *ANGUILLA ANGUILLA* L. *J. Therm. Biol.* 6(4):201-208. Oct. 1981. SFA 27(1)
[Inst. Zool., Univ. Kiel, D-2300 Kiel, West Germany]

82-000110 Johnston, C. E. and R. L. Saunders. PARR-SMOLT TRANSFORMATION OF YEARLING ATLANTIC SALMON (*SALMO SALAR*) AT SEVERAL REARING TEMPERATURES. *Can. J. Fish. Aquatic Sci.* 38(10):1189-1198. Oct. 1981. In English with French summ. SFA 27(1)
[Dep. Biol., Univ. Prince Edward Island, Charlottetown, PEI CIA 4P3, Canada]

82-000111 Kagawa, H. and Y. Nagahama. *IN VITRO* EFFECTS OF PROSTAGLANDINS ON OVULATION IN GOLDFISH *CARASSIUS AURATUS*. *Bull. Jpn. Soc. Sci. Fish.* 47(9):1119-1121. Sept. 1981. In Japanese with English summ. SFA 27(1)
[Natl. Inst. Basic Biol., Okazaki 444, Japan]

82-000112 Karpov, A. K. and G. G. Novikov. HEMOGLOBIN ALLOFORMS IN COD, *GADUS MORHUA* (GADIFORMES, GADIDAE), THEIR FUNCTIONAL CHARACTERISTICS AND OCCURRENCE IN POPULATIONS. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):45-49. 1980. SFA 27(1)
[Ichthyol. Fac. Moscow Univ., USSR] It is demonstrated that the electrophoretically separable allelic forms of cod hemoglobin differ in their capacity to combine oxygen at different temperatures. The occurrence of hemoglobin alloforms in cod populations corresponds to temperature conditions in the areas concerned. Hemoglobin polymorphism is of a selective nature.

PHYSIOLOGY (CONTINUED)

82-000113 Klyashtorin, L. V. and R. F. Salikzyanov. A CHANGE IN METABOLIC RATE IN TIME AND THE INFLUENCE OF THE GROUP EFFECT. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):132-137. 1980. SFA 27(1)
[VNIRO, Moscow, USSR]

82-000114 Koss, T. F. and A. H. Houston. HEMOGLOBIN LEVELS AND RED CELL IONIC COMPOSITION IN GOLDFISH (*CARASSIUS AURATUS*) EXPOSED TO CONSTANT AND DIURNALLY CYCLING TEMPERATURES. *Can. J. Fish. Aquatic Sci.* 38(10):1182-1188. Oct. 1981. SFA 27(1)
[A. H. Houston: Dep. Biol. Sci., Brock Univ., St. Catharines, ON L2S 3A1, Canada]

82-000115 Kothbauer, H. and H. Schenkel-Brunner. IMMUNCHEMISCHE UNTERSUCHUNGEN AN FISCHEIERN UND KRÖTENLAICH: ZUM AUFTRETEN VON GLYKOSIDASEN WÄHREND DES SCHLÜPFVORGANES. [IMMUNOCHEMICAL INVESTIGATIONS ON FISH EGGS AND TOAD SPAWN: ON THE APPEARANCE OF GLYCOSIDASES DURING THE HATCHING PROCESS.] *Zool. Anz.* 206(5-6):354-360. 1981. In German with English summ. SFA 27(1)
[Inst. Zool., Univ. Wien, A-1010 Wien 9, Wahringerstr. 17, Austria]

82-000116 Kramer, D. L. and J. P. Mehegan. AQUATIC SURFACE RESPIRATION, AN ADAPTIVE RESPONSE TO HYPOXIA IN THE GUPPY, *POECILIA RETICULATA* (PISCES, POECILIIDAE). *Environ. Biol. Fishes* 6(3-4):299-313. 1 Nov. 1981. SFA 27(1)
[Dep. Biol., McGill Univ., 1205 Ave. Docteur Penfield, Montreal, PQ H3A 1B1, Canada]

82-000117 Kuz'mina, V. V. PHENOTYPIC VARIABILITY OF SOME CHARACTERISTICS OF THE DIGESTIVE SYSTEM IN THE RYBINSK RESERVOIR BREAM, *ABRAMIS BRAMA*. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):125-133. 1980. SFA 27(1)
[Inst. Biol. Inland Waters, USSR Acad. Sci., Borok, Yaroslavl Prov., USSR]

82-000118 Lésel, R. and P. Péringer. INFLUENCE OF TEMPERATURE ON THE BACTERIAL MICROFLORA IN *SALMO GAIRDNERI* RICHARDSON. *Arch. Hydrobiol.* 93(1):109-120. 1981. SFA 27(1)
[INRA, Cent. Rech. Hydrobiol., Lab. Microorganismes, Saint-Pée-sur Nivelle, F-64310 Ascain, France]

82-000119 Leatherland, J. F. and R. N. Nutti. EFFECTS OF BOVINE GROWTH HORMONE ON PLASMA FFA CONCENTRATIONS AND LIVER, MUSCLE AND CARCASS LIPID CONTENT IN RAINBOW TROUT, *SALMO GAIRDNERI* RICHARDSON. *J. Fish Biol.* 19(5):487-498. Nov. 1981. SFA 27(1)
[Dep. Zool., Coll. Biol. Sci., Univ. Guelph, Guelph, ON, Canada]

82-000120 Leray, C. PATTERNS OF PURINE NUCLEOTIDES IN SOME NORTH SEA FISH ERYTHROCYTES. *Comp. Biochem. Physiol. B Comp. Biochem.* 71(1):77-81. 1982.
[Lab. Physiol. Comp. Regul., CNRS, B.P. 20CR, 67037 Strasbourg-Cedex, France]

82-000121 Luts, G. I. ACTIVITY OF THE SPERMATOZOA OF *CULPEONELLA DELICATULA* "AZOV TYULKA" IN WATER OF DIFFERENT SALINITY. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):158-159. 1980. SFA 27(1)
[AzNIIRKh, Rostov-on-Don, USSR]

PHYSIOLOGY (CONTINUED)

82-000122 Maccioni, R. B. and W. Mellado. CHARACTERISTICS OF THE *IN VITRO* ASSEMBLY OF BRAIN TUBULIN OF *CYPRINUS CARPIO*. *Comp. Biochem. Physiol. B Comp. Biochem.* 70(2):375-380. 1981. SFA 27(1)
[Dep. Biochem./Biophys. Genet., Univ. Colo., Health Sci. Cent., Denver 80262]

82-000123 MacGregor, R. III; J. J. Dindo and J. H. Finucane. CHANGES IN SERUM ANDROGENS AND ESTROGENS DURING SPAWNING IN BLUEFISH, *POMATOMUS SALTATOR*, AND KING MACKEREL, *SCOMBEROMORUS CAVALLA*. *Can. J. Zool.* 59(1):1749-1754. Sept. 1981. In English with French summ. SFA 27(1)
[Dep. Biol., Univ. Ala., Birmingham 35294]

82-000124 Majkowski, J. and K. G. Waiwood. A PROCEDURE FOR EVALUATING THE FOOD BIOMASS CONSUMED BY A FISH POPULATION. *Can. J. Fish. Aquatic Sci.* 38(10):1199-1208. Oct. 1981. In English with French summ. SFA 27(1)
[Div. Fish. Res., CSIRO Mar. Lab., P.O. Box 21, Cronulla, NSW 2230, Australia]

82-000125 Marshall, W. S. ACTIVE TRANSPORT OF Rb^+ ACROSS SKIN OF THE TELEOST *GILLICHTHYS MIRABILIS*. *Am. J. Physiol.* 241(5):F482-F486. Nov. 1981. SFA 27(1)
[La. State Univ. Eye Cent., La. State Univ. Med. Cent. Sch. Med., New Orleans 70112]

82-000126 Marshall, W. S. SODIUM DEPENDENCY OF ACTIVE CHLORIDE TRANSPORT ACROSS ISOLATED FISH SKIN (*GILLICHTHYS MIRABILIS*). *J. Physiol. (Lond.)* 319:165-178. Oct. 1981. SFA 27(1)
[LSU Eye Cent., La. State Univ. Med. Cent., 136 South Roman St., New Orleans, LA 70112]

82-000127 Michibata, H. LABELING FISH WITH AN ACTIVABLE ELEMENT THROUGH THEIR DIET. *Can. J. Fish. Aquatic Sci.* 38(10):1281-1282. Oct. 1981. In English with French summ. SFA 27(1)
[Biol. Inst., Fac. Sci., Toyama Univ., Toyama 930, Japan]

82-000128 Miki, W.; K. Yamaguchi and S. Konosu. COMPARISON OF CAROTENOIDS IN THE OVARIES OF MARINE FISH AND SHELLFISH. *Comp. Biochem. Physiol. B Comp. Biochem.* 71(1):7-11. 1982. SFA 27(1)
[Lab. Mar. Biochem., Fac. Agric., Univ. Tokyo, Tokyo, Japan]

82-000129 Mochizuki, A. and M. Matsumiya. [LYSOZYME ACTIVITY IN ORGANS OF MARINE FISHES.] *Bull. Jpn. Soc. Sci. Fish.* 47(8):1065-1068. Aug. 1981. In Japanese with English summ. SFA 27(1)
[Coll. Agric. Vet. Med., Nihon Univ., 34-1, Shimouma-3, Setagaya, Tokyo 154, Japan]

82-000130 Moon, T. W. and I. A. Johnston. AMINO ACID TRANSPORT AND INTERCONVERSIONS IN TISSUES OF FRESHLY CAUGHT AND FOOD-DEPRIVED PLAICE, *PLEURONECTES PLATESSA* L. *J. Fish Biol.* 19(6):653-663. Dec. 1981. SFA 27(1)
[I. A. Johnston: Dep. Physiol., Bute Med. Bldg., St. Andrews Univ., St. Andrews, Fife KY16 9TS, Scotland]

PHYSIOLOGY (CONTINUED)

82-000131 Morata, P.; A. M. Vargas; F. Sánchez-Medina; M. Garcia; G. Cardenette and S. Zamora. EVOLUTION OF GLUCONEOGENIC ENZYME ACTIVITIES DURING STARVATION IN LIVER AND KIDNEY OF THE RAINBOW TROUT (*SALMO GAIRDNERI*). *Comp. Biochem. Physiol. B Comp. Biochem.* 71(1):65-70. 1982. SFA 27(1)
[Dep. Biochem., Univ. Granada, Granada, Spain]

82-000132 Morris, S. M. and J. T. Albright. SUPEROXIDE DISMUTASE, CATALASE, AND GLUTATHIONE PEROXIDASE IN THE SWIM BLADDER OF THE PHYSOCLISTOUS FISH, *OPSANUS TAU* L. *Cell Tissue Res.* 220(4):739-752. Nov. 1981. SFA 27(1)
[Boston Univ. Biol. Sci. Cent., 2 Cummington St., Boston, MA 02215]

82-000133 Natochin, Yu. V.; V. I. Luk'yanenko; Ye. A. Lavrova and G. F. Metallov. MAGNESIUM METABOLISM IN THE RUSSIAN STURGEON, *ACIPENSER GÜLDENSTÄDTI*, AT VARYING SALINITY. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):108-115. 1980. SFA 27(1)
[Inst. Evol. Physiol. Biochem., USSR Acad. Sci., Leningrad, USSR]

82-000134 Nishi, K. CIRCADIAN RHYTHM IN THE PHOTOSENSITIVE DEVELOPMENT OF THE OVARY IN THE MOSQUITOFISH, *GAMBUSIA AFFINIS AFFINIS* (BAIRD ET GIRARD). *Bull. Fac. Fish. Hokkaido Univ.* 32(3):211-220. Sept. 1981. SFA 27(1)
[Lab. Fresh-Water Fish-Cult., Fac. Fish., Hokkaido Univ., Hokodate 041, Japan]

82-000135 Ohta, T. and T. Iwamatsu. MORPHOLOGICAL OBSERVATIONS ON CLEAVAGE OF THE EGG OF THE MEDAKA, *ORYZIAS LATIPES*, FOLLOWING INJECTION WITH FLAGELLAR MICROTUBULES OF SEA URCHIN SPERMATOZOA. *J. Exp. Zool.* 218(2):293-299. Nov. 1981. SFA 27(1)
[Dep. Biol., Aichi Univ., Kariya-shi, Aichi 448, Japan]

82-000136 Ojha, J.; A. K. Patra; N. Biswas and J. S. D. Munshi. INTERSPECIFIC VARIATIONS IN THE BIMODAL OYXGEN UPTAKE OF THE GENUS CHANNA. *J. Anim. Physiol. Anim. Nutr.* 46(4):165-170. 1981. SFA 27(1)
[Dep. Zool., Bhagalpur Univ. Bhagalpur, India]

82-000137 Olivereau, M.; J. M. Olivereau and C. Aimar. INFLUENCE OF DEIONIZED WATER SUPPLEMENTED OR NOT WITH DIFFERENT IONS ON PROLACTIN CELL ACTIVITY AND OSMOTIC REGULATION IN THE GOLDFISH. *Comp. Biochem. Physiol. A Comp. Physiol.* 71(1):11-16. 1981. SFA 27(1)
[Lab. Physiol., Inst. Oceanogr., 195 rue Saint-Jacques 75005 Paris, France]

82-000138 Oshiro, T. and T. Hibiya. [RELATIONSHIP OF YOLK GLOBULES FUSION TO OOCYTE WATER ABSORPTION IN THE PLAICE *LIMANDA YOKOHAMAE* DURING MEIOTIC MATURATION.] *Bull. Jpn. Soc. Sci. Fish.* 47(9):1123-1130. Sept. 1981. In Japanese with English summ. SFA 27(1)
[Natl. Res. Inst. Aquacult., Hiruta, Tamaki, Watarai, Mie 519-04, Japan]

82-000139 Otwell, W. S. and W. L. Rickards. CULTURED AND WILD AMERICAN EELS, *ANGUILLA ROSTRATA*: FAT CONTENT AND FATTY ACID COMPOSITION. *Aquaculture* 26(1-2):67-76. Nov. 1981. SFA 27(1)
[Dep. Food Sci. Human Nutr., Univ. Fla., Gainesville 32611]

PHYSIOLOGY (CONTINUED)

82-000140 Paxton, R. EFFECTS OF COLD ACCLIMATION AND THE ROLE OF THE PITUITARY ON CARBOHYDRATE METABOLISM IN GOLDFISH, *CARASSIUS AURATUS*, AND KILLIFISH, *FUNDULUS HETEROCLITUS*. *Ph.D. dissertation, Univ. Cincinnati* 381p. 1981. From Diss. Abstr. Int. B Sci. Eng. 42(5):1172. Nov. 1981. SFA 27(1)

82-000141 Romanenko, V. D. EFFECT OF ECOLOGICAL FACTORS ON METABOLISM OF FISHES REARED IN WARM WATER. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):133-138. 1980. SFA 27(1)

[Inst. Hydrobiol., Ukrainian Acad. Sci., Kiev, USSR] Consideration is given to the effect of warm water container and tank rearing of fishes on their metabolic processes. When water temperature is increased to 30°C there is an acid shift in the pH of the blood due to a drop in the concentration of bicarbonates and increased formation of lactic acid. There is simultaneous marked activation of the synthesis of lipids and, to a lesser extent, proteins. These changes are based on the thermal activation of carboxylation reactions, increased breakdown of lipotropic substances, and also the ingestion of a large quantity of plant components rich in carbohydrates. Possible ways of normalizing the metabolism of fishes reared in warm water are examined.

82-000142 Rosen, M. H. and A. Perlmutter. A TECHNIQUE FOR ASSAYING THE ACTIVITIES OF α-GPD, LDH, AND MDH IN THE TELEOST, THE GOLDFISH, *CARASSIUS AURATUS*. *Comp. Biochem. Physiol. B Comp. Biochem.* 71(1):113-117. 1982. SFA 27(1)

[Dep. Biol., Coll. Staten Island, 715 Ocean Terrace, Staten Island, NY 10301]

82-000143 Saito, T.; H. Kondo and J. Toyoda. IONIC MECHANISMS OF TWO TYPES OF ON-CENTER BIPOLAR CELLS IN THE CARP RETINA. II. THE RESPONSES TO ANNULAR ILLUMINATIONS. *J. Gen. Physiol.* 78(5):569-589. Nov. 1981. SFA 27(1)

[Dep. Physiol., St. Marianna Univ. Sch. Med., Takatsu-ku, Kawasaki 213, Japan]

82-000144 Sakai, D. K. SPONTANEOUS AND ANTIBODY-DEPENDENT HEMOLYSIS ACTIVITIES OF FISH SERA AND INAPPLICABILITY OF MAMMALIAN COMPLEMENTS TO THE IMMUNE HEMOLYSIS REACTION OF FISHES. *Bull. Jpn. Soc. Sci. Fish.* 47(8):979-991. Aug. 1981. SFA 27(1)

[Hokkaido Fish Hatchery, 2, Nakanoshima-2, Toyohira-ku, Sapporo 062, Japan]

82-000145 Sandnes, K. and O. R. Braekkan. ASCORBIC ACID AND THE REPRODUCTIVE CYCLE OF OVARIES IN COD (*GADUS MORRHUA*). *Comp. Biochem. Physiol. A Comp. Physiol.* 70(4):545-546. 1981. SFA 27(1)

[Inst. Vitamin Res., Dir. Fish., P.O. Box 4285, 5013 Nygaardstangen, Bergen, Norway]

82-000146 Sayfullin, R. R. FEATURES OF THE SEXUAL MATURATION OF THE STERLET, *ACIPENSER RUTHENUS*, UNDER THE CONDITIONS OF KUYBYSHEV RESERVOIR. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):66-72. 1980. SFA 27(1)

[Dep. Invert. Zool., Kazan Univ., USSR]

82-000147 Shoubridge, E. A. THE METABOLIC STRATEGY OF THE ANOXIC GOLDFISH. *Ph.D. dissertation, Univ. British Columbia* 1981. From Diss. Abstr. Int. B Sci. Eng. 42(6):2263. Dec. 1981. SFA 27(1)

PHYSIOLOGY (CONTINUED)

82-000148 Skow, L. C. and M. E. Chittenden, Jr. DIFFERENCES IN HEMOGLOBIN PHENOTYPES AMONG SPANISH MACKEREL, *SCOMBEROMORUS MACULATUS*. *Northeast Gulf Sci.* 5(1):67-70. Oct. 1981. SFA 27(1)
[Biol. Div., P.O. Box Y, Oak Ridge Natl. Lab., Oak Ridge, TN 37830]

82-000149 Solsona, C.; J. E. Esquerda and J. Marsal. EFFECTS OF OUABAIN AND ELECTRICAL STIMULATION ON THE FINE STRUCTURE OF NERVE ENDINGS IN THE ELECTRIC ORGAN OF *TORPEDO MARMORATA*. *Cell Tissue Res.* 220(4):857-871. Nov. 1981. SFA 27(1)
[J. Marsal: Fac. Med., Càtedra Histol., c/Casanova 143, Barcelona-36, Spain]

82-000150 Stone, B. B. and B. D. Sidell. METABOLIC RESPONSES OF STRIPED BASS (*MORONE SAXATILIS*) TO TEMPERATURE ACCLIMATION. I. ALTERATIONS IN CARBON SOURCES FOR HEPATIC ENERGY METABOLISM. *J. Exp. Zool.* 218(3):371-379. Dec. 1981. SFA 27(1)
[Migratory Fish Res. Inst., Univ. Me., Orono 04469]

82-000151 Stroband, H. W. J. and F. H. Van Der Veen. LOCALIZATION OF PROTEIN ABSORPTION DURING TRANSPORT OF FOOD IN THE INTESTINE OF THE GRASSCARP, *CTENOPHARYNGODON IDELLA* (VAL.). *J. Exp. Zool.* 218(2):149-156. Nov. 1981. SFA 27(1)
[Agric. Univ., Dep. Exp. Anim. Morphol., Zodiac, Marijkeweg 40, Wageningen, Netherlands]

82-000152 Suarez, R. K. MECHANISMS OF GLUCONEOGENIC ACTIVATION IN THE RAINBOW TROUT LIVER. *Ph.D. dissertation, Univ. British Columbia* 1980. From Diss. Abstr. Int. B Sci. Eng. 42(6):2263. Dec. 1981. SFA 27(1)

82-000153 Suzuki, K.; B. Tamaoki and K. Hirose. *IN VITRO* METABOLISM OF 4-PREGNENES IN OVARIES OF A FRESHWATER TELEOST, THE AYU (*PLECOGLOSSUS ALTIVELIS*): PRODUCTION OF 17α, 20β-DIHYDROXY-4-PREGNEN-3-ONE AND ITS 4β-REDUCED METABOLITES, AND ACTIVATION OF 3β- AND 20β-HYDROXYSTEROID DEHYDROGENASES BY TREATMENT WITH A FISH GONADOTROPIN. *Gen. Comp. Endocrinol.* 45(4):473-481. Dec. 1981. SFA 27(1)
[Natl. Inst. Radiol. Sci., Anagawa-4-chome, Chiba-shi 260, Japan]

82-000154 Suzuki, K.; B.-I. Tamaoki and Y. Nagahama. *IN VITRO* SYNTHESIS OF AN INDUCER FOR GERMINAL VESICLE BREAKDOWN OF FISH OOCYTES, 17α,20β-DIHYDROXY-4-PREGNEN-3-ONE BY OVARIAN TISSUE PREPARATION OF AMAGO SALMON (*ONCORHYNCHUS RHODURUS*). *Gen. Comp. Endocrinol.* 45(4):533-535. Dec. 1981. SFA 27(1)
[Natl. Inst. Radiol. Sci., Anagawa-4-chome, Chiba-shi 260, Japan]

82-000155 Waarde, A. van and F. Kesbeke. NITROGEN METABOLISM IN GOLDFISH, *CARASSIUS AURATUS* (L.) INFLUENCE OF ADDED SUBSTRATES AND ENZYME INHIBITORS ON AMMONIA PRODUCTION OF ISOLATED HEPATOCYTES. *Comp. Biochem. Physiol. B Comp. Biochem.* 70(3):499-507. 1981. SFA 27(1)
[Zool. Lab., Dep. Physiol., State Univ. Leiden, P.O. Box 9516, 2300 RA Leiden, Netherlands]

82-000156 Yamada, S.; K. L. Simpson; Y. Tanaka and T. Katayama. PLASMA AMINO ACID CHANGES IN RAINBOW TROUT *SALMO GAIRDNERI* FORCE-FED CASEIN AND A CORRESPONDING AMINO ACID MIXTURE. *Bull. Jpn. Soc. Sci. Fish.* 47(8):1035-1040. Aug. 1981. SFA 27(1)
[Lab. Mar. Biochem., Fac. Fish., Kagoshima Univ., 50-20, Shimoarata-4, Kagoshima 890, Japan]

PHYSIOLOGY (CONTINUED)

82-000157 Zhukinskiy, V. N. and Ye. D. Kim. CHARACTERISTICS OF AGE-RELATED VARIABILITY IN THE COMPOSITION OF AMINO ACIDS AND LIPIDS IN MATURE AND OVERRIPEN EGGS OF THE AZOV ROACH, *RUTILUS RUTILUS HECKELI*, AND THE BREAM, *ABRAMIS BRAMA*. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):121-132. 1980. SFA 27(1)
[Inst. Hydrobiol., Ukranian SSR Acad. Sci., Kiev, USSR]

GENETICS, VARIATION STUDIES AND HYBRIDIZATION

82-000158 Blanc, J. M. and J. F. Toulorge. VARIABILITÉ GÉNÉTIQUE DE LA PERFORMANCE DE NAGE CHEZ L'ALEVIN DE TRUITE FARIO (*SALMO TRUTTA*). [GENETIC VARIABILITY OF THE SWIMMING PERFORMANCE OF BROWN TROUT ALEVIN (*SALMO TRUTTA*).] *Ann. Genet. Sel. Anim.* 13(2):165-176. 1981. In French with English summ. SFA 27(1)
[Cent. Rech. Hydrobiol., Saint-Pée-Sur-Nivelle, F 64310 Ascain, France]

82-000159 Dauble, D. D. and R. L. Buschbom. ESTIMATES OF HYBRIDIZATION BETWEEN TWO SPECIES OF CATOSTOMIDS IN THE COLUMBIA RIVER. *Copeia* 1981(4):802-810. 29 Dec. 1981. SFA 27(1)
[Ecosyst. Dep., Battelle Pac. Northwest Lab., Richland, WA 99352]

82-000160 Eriksson, L.-O.; H. Lundqvist and H. Johansson. ON THE NORMALITY OF SIZE DISTRIBUTION AND THE PRECOCIOUS MATURATION IN A BALTIC SALMON, *SALMO SALAR* L., PARR POPULATION. *Aquilo* 19:81-86. 1979. SFA 27(1)
[Dep. Ecol. Zool., Univ. Umea, Sweden] Length-distribution and growth-patterns of hatchery-reared Baltic salmon parr (*Salmo salar* L.), offspring of crossbreedings of wild and hatchery-reared salmon, were studied at the Norrfors hatchery in northern Sweden (63°50'N, 20°05'E). The size-distribution was unimodal, and no sex differences were seen until the end of the second summers growth. At the end of the second summer when fish were in the age 1+, about 50% of the males became precociously mature and retarded in growth. However, at the onset of maturation precocious males did not differ in size, either from immature males or from females. Males ripening for the first time as 2+ became retarded in growth in the same manner as earlier precosiously maturing males (1+). Females remained immature throughout the experiment. Thus three categories with different size distributions could be distinguished in the three-summer old salmon parr population. It is stated that genetic factors rather than relative size determine year of precocity of an age-class in Baltic salmon.

82-000161 Ferguson, M. M. and D. L. G. Noakes. SOCIAL GROUPING AND GENETIC VARIATION IN COMMON SHINERS, *NOTROPIS CORNUTUS* (PISCES, CYPRINIDAE). *Environ. Biol. Fishes* 6(3-4):357-360. 1 Nov. 1981. SFA 27(1)
[Dep. Zool., Univ. Guelph, Guelph, ON N1G 2W1, Canada] Heterogeneous gene frequencies of Est-1 across groups of *Notropis cornutus* provide evidence of behaviorally imposed restrictions on stock structuring. Positive fixation indices (F_{IS}=0.056 and F_{IT}=0.085) were reflected by a deficiency of heterozygotes for pooled groups. The degree of subdivision of *N. cornutus* stocks cannot be evaluated with the present evidence, but it is likely that their schooling behaviour is associated with significant genotypic structuring of the species.

82-000162 Fitzsimons, J. M. and A. J. Doucette, Jr. KARYOLOGY OF THE SHADS *DOROSOMA CEPEDIANUM* AND *D. PETENENSE* (OSTEICHTHYES: CLUPEIFORMES). *Copeia* 1981(4):908-911. 29 Dec. 1981. SFA 27(1)
[Mus. Zool., La. State Univ., Baton Rouge 70893]

GENETICS, VARIATION STUDIES AND HYBRIDIZATION (CONTINUED)

82-000163 Grant, W. S. BIOCHEMICAL GENETIC VARIATION, POPULATION STRUCTURES, AND EVOLUTION OF ATLANTIC AND PACIFIC HERRING. *Ph.D. dissertation, Univ. Wash.* 149p. 1981. From Diss. Abstr. Int. B Sci. Eng. 42(6):2260. Dec. 1981. SFA 27(1)

82-000164 Kornfield, I. DISTRIBUTION OF CONSTITUTIVE HETEROCHROMATIN AND THE EVOLUTION OF SEX CHROMOSOMES IN *FUNDULUS*. *Copeia* 1981(4):916-918. 29 Dec. 1981. SFA 27(1)
[Migratory Fish Res. Inst., Univ. Me., Orono 04469]

82-000165 Krylova, V. D. MORPHOMETRIC CHARACTERISTICS OF A HYBRID BETWEEN THE BELUGA, *HUSO HUSO*, AND THE SEVRYUGA, *ACIPENSER STELLATUS*. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):89-97. 1980. SFA 27(1)
[VNIRO, Moscow, USSR]

82-000166 Lincoln, R. F. SEXUAL MATURATION IN FEMALE TRIPLOID PLAICE, *PLEURONECTES PLATESSA*, AND PLAICE x FLOUNDER, *PLATICHTHYS FLESUS*, HYBRIDS. *J. Fish Biol.* 19(5):499-507. Nov. 1981. SFA 27(1)
[Minist. Agric. Fish. Food, Dir. Fish. Res., Fish. Lab., Lowestoft, Suffolk NR33 0HT, England]

82-000167 Luempert, L. G. III. GENETIC SOURCES OF VARIATION IN WEIGHT AND SURVIVAL OF BROOK TROUT (*SALVELINUS FONTINALIS*). *Ph.D. dissertation, N.C. State Univ.* 57p. 1981. From Diss. Abstr. Int. B Sci. Eng. 42(5):1751. Nov. 1981. SFA 27(1)

82-000168 Ráb, P. KARYOTYPE OF EUROPEAN CATFISH *SILURUS GLANIS* (SILURIDAE, PISCES), WITH REMARKS ON CYTOGENETICS OF SILUROID FISHES. *Folia Zool.* 30(3):271-286. 1981. In English with Russian summ. SFA 27(1)
[Inst. Anim. Physiol. Genet., Dep. Genet., Czech. Acad. Sci., Liběchov, Czechoslovakia] The karyotype of the European catfish *Silurus glanis* from southern Bohemia was examined. The diploid chromosome number was 2n=60 in all juvenile specimens examined. The karyotype of *Silurus glanis* comprised 14 pairs of metacentric, 13 pairs of submetacentric and 3 pairs of subtelocentric chromosomes forming the NF value of 120. The chromosome pair No. 1 was satellited, the NOR (nucleolar organizer region) is probably localized in the satellited region of this chromosome pair. The present status of the cytogenetics of siluroid fishes is briefly reviewed to point out the complicated mode of the ploidy and chromosomal evolution within the suborder *Siluroidei*.

82-000169 Ráb, P. KARYOTYPE OF EUROPEAN MUDMINNOW, *UMBRA KRAMERI*. *Copeia* 1981(4):911-913. 29 Dec. 1981. SFA 27(1)
[Inst. Anim. Physiol. Genet., Dep. Genet., Czech. Acad. Sci., 277 21 Liběchov, Czechoslovakia]

82-000170 Triantaphyllidis, C. D.; H. Damianakis; P. S. Economidis and J. Karakousis. GENETIC VARIATION IN GREEK BARBEL POPULATIONS--I. ESTERASES, LDH, MDH, ME AND PGM IN *BARBUS MERIDIONALIS* (PISCES, CYPRINIDAE). *Comp. Biochem. Physiol. B Comp. Biochem.* 70(2):289-293. 1981. SFA 27(1)
[Lab. Gen. Biol., Univ. Thessaloniki, Greece]

82-000171 Vasil'yev, V. P.; L. I. Sokolov and Ye. V. Serebryakova. KARYOTYPES OF THE SIBERIAN STURGEON, *ACIPENSER BAERI*, OF THE LENA RIVER AND SOME ASPECTS OF KARYOTYPE EVOLUTION IN ACIPENSERIFORMES. *J. Ichthyol.*

GENETICS, VARIATION STUDIES AND HYBRIDIZATION (CONTINUED)

82-000171 CONTINUED (*Engl. Transl. Vopr. Ikhtiol.*) 20(6):37-44. 1980. SFA 27(1)
[A. N. Severtsov Inst. Evol. Morphol. Anim. Ecol., USSR Acad Sci., Moscow, USSR]

82-000172 Wolters, W. R. TRIPLOIDY IN CHANNEL CATFISH, *ICTALURUS PUNCTATUS*. *Ph.D. dissertation, Purdue Univ.* 60p. 1981. From Diss. Abstr. Int. B Sci. Eng. 42(5):1688. Nov. 1981. SFA 27(1)

82-000173 Yamazoe, Y. COMPARATIVE ELECTROPHEROGRAMS OF MUSCLE PROTEINS OF AMPHIBIOUS FISHES. *Bull. Jpn. Soc. Sci. Fish.* 47(8):1047-1049. Aug. 1981. SFA 27(1)
[Dep. Food Nutr., Nagasaki Women's Junior Coll., Yayoi, Nagasaki 850, Japan]

BEHAVIOR

82-000174 Albrecht, H. ASPECTS OF SOUND COMMUNICATION IN SOME CARIBBEAN REEF FISHES (*EUPOMACENTRUS* SPEC., PISCES: POMACENTRIDAE). *Bijdr. Dierkd.* 51(1):70-80. 1981. SFA 27(1)
[Lab. Anim. Behav., Univ. Amsterdam, The Netherlands] Four species of sympatric damselfishes (*Eupomacentrus*, Pomacentridae) from certain Florida reefs can be distinguished by certain sound characteristics used during courtship. Apparently the fish use these characteristics for species recognition. These characteristics involve the temporal structure of a sound, i.e. the length of the pulse interval, containing the necessary code for communication. In Curaçao members of the same species did not use the same sound characteristics for species recognition as in Florida. Strangely enough, some were able to differentiate between local congeners, but unable to recognize members of their own species. The question arises whether local dialects are in different codes, in different parts of the species' distribution range. These populations could live in local restricted areas, as recordings from one species suggest. It is possible that apart from the temporal structure, the frequency spectrum carries important information for the identification of the species in question. This contradicts earlier conclusions.

82-000175 Blaxter, J. H. S.; J. A. B. Gray and E. J. Denton. SOUND AND STARTLE RESPONSES IN HERRING SHOALS. *J. Mar. Biol. Assoc. U.K.* 61(4):851-869. Nov. 1981. SFA 27(1)
[Dunstaffnage Mar. Res. Lab., Oban, Scotland]

82-000176 Blaxter, J. H. S. and D. E. Hoss. STARTLE RESPONSE IN HERRING: THE EFFECT OF SOUND STIMULUS FREQUENCY, SIZE OF FISH AND SELECTIVE INTERFERENCE WITH THE ACOUSTICO-LATERALIS SYSTEM. *J. Mar. Biol. Assoc. U.K.* 61(4):871-879. Nov. 1981. SFA 27(1)
[Dunstaffnage Mar. Res. Lab., Oban, Scotland]

82-000177 Calhoun, S. W.; T. L. Beitinger and E. G. Zimmerman. SIMILARITY IN SELECTED TEMPERATURES OF TWO ALLOPATRIC POPULATIONS OF BLACKTAIL SHINER, *NOTROPIS VENUSTUS* (CYPRINIDAE). *Southwest. Nat.* 26(4):441-442. 20 Nov. 1981. SFA 27(1)
[Dep. Biol., Tex. A&M Univ., College Station 77843]

BEHAVIOR (CONTINUED)

82-000178 Colton, D. E. and W. S. Alevizon. DIURNAL VARIABILITY IN A FISH ASSEMBLAGE OF A BAHAMIAN CORAL REEF. *Environ. Biol. Fishes* 6(3-4):341-345. 1 Nov. 1981. SFA 27(1)
[Dep. Biol. Sci., Fla. Inst. Technol., Melbourne 32901] Variation in the diurnal composition of a fish assemblage of a Bahamian coral reef was investigated by comparing visual counts of fishes taken along a 100 x 4 m wide fixed transect at four times: 0900, 1200, 1500 and 1800 hours during the summer of 1979. One sample per day was obtained at each time period over a span of 20 consecutive days. Forty-two species were recorded in these samples, with 25 occurring frequently enough to permit statistical analysis of diurnal variations in abundance. Of the 25 species compared, nearly one fourth (6 species) displayed significant variation in abundance patterns among the four time periods tested. It is suggested, because of the strong possiblity of bias which might otherwise be introduced because of these variations, that repetitive quantitative visual censusing of coral reef fishes be undertaken at about the same time each day.

82-000179 Day, M. H., (ed.). VERTEBRATE LOCOMOTION. *Symp. Zool. Soc. Lond.* no. 48. xvii + 471p. 1981. SFA 27(1)
[Dep. Anat., St. Thomas's Hosp. Med. Sch., London, England]

82-000180 De Martini, E. E. and J. A. Coyer. CLEANING AND SCALE-EATING IN JUVENILES OF THE KYPHOSID FISHES, *HERMOSILLA AZUREA* AND *GIRELLA NIGRICANS*. *Copeia* 1981(4):785-789. 29 Dec. 1981. SFA 27(1)
[Univ. Calif., 533 Stevens Ave., Solana Beach 92075]

82-000181 Ercolini, A.; R. Berti and A. Cianfanelli. AGGRESSIVE BEHAVIOUR IN *UEGITGLANIS ZAMMARANOI* GIANFERRARI (CLARIIDAE SILURIFORMES), ANOPHTHALMIC PHREATIC FISH FROM SOMALIA. *Ital. J. Zool.* 14(suppl.):39-56. 1981. SFA 27(1)
[Ist. Zool., Univ. Firenze, Italy]

82-000182 Fausch, K. D. and R. J. White. COMPETITION BETWEEN BROOK TROUT (*SALVELINUS FONTINALIS*) AND BROWN TROUT (*SALMO TRUTTA*) FOR POSITIONS IN A MICHIGAN STREAM. *Can. J. Fish. Aquatic Sci.* 38(10):1220-1227. Oct. 1981. SFA 27(1)
[Dep. Fish. Wildl., Mich. State Univ., East Lansing 48824]

82-000183 Flanagan, C. A. FOURIER MORPHOMETRICS OF REEF FISHES OF THE GULF OF CALIFORNIA. *Ph.D. dissertation, Univ. Ariz.* 176p. 1981. From Diss. Abstr. Int. B Sci. Eng. 42(6):2204. Dec. 1981. SFA 27(1)

82-000184 Helfman, G. S. TWILIGHT ACTIVITIES AND TEMPORAL STRUCTURE IN A FRESHWATER FISH COMMUNITY. *Can. J. Fish. Aquatic Sci.* 38(11):1405-1420. Nov. 1981. SFA 27(1)
[Zool. Dep., Univ. Ga., Athens 30602]

82-000185 Inoue, M.; H. Yatomi; M. Aoki; S. Ooga; T. Utida and A. Miyashita. [STUDIES ON DOMESTICATON AND EXTENSIVE BREEDING OF SKIPJACK, TUNAS AND OTHER FISHES--III. BEHAVIOUR OF SOME "FOLLOWING", AND SHORT HOMING BEHAVIOUR OF THE SCOMBRIDAE AND THE CARANGIDAE DOMESTICATED IN FISH PRESERVE (ARTIFICIAL FLOATING FISH REEF).] *J. Fac. Mar. Sci. Technol. Tokai Univ.* No. 14. p. 343-355. 1981. In Japanese with English summ. SFA 27(1)
[Fac. Mar. Sci. Technol., Tokai Univ., Shimizu, Japan 424]

BEHAVIOR (CONTINUED)

82-000186 Kelso, B. W. and T. G. Northcote. CURRENT RESPONSE OF YOUNG RAINBOW TROUT FROM INLET AND OUTLET SPAWNING STOCKS OF A BRITISH COLUMBIA LAKE. *Int. Ver. Theor. Angew. Limnol. Verh.* 21(Part 2):1214-1221. 1981. SFA 27(1)
[Can. Dep. Environ., Environ. Prot. Serv., Vancouver, BC, Canada]

82-000187 Kelso, B. W.; T. G. Northcote and C. F. Wehrhahn. GENETIC AND ENVIRONMENTAL ASPECTS OF THE RESPONSE TO WATER CURRENT BY RAINBOW TROUT (*SALMO GAIRDNERI*) ORIGINATING FROM INLET AND OUTLET STREAMS OF TWO LAKES. *Can. J. Zool.* 59(11):2177-2185. Nov. 1981. In English with French summ. SFA 27(1)
[Can. Dep. Environ., Environ. Prot. Serv., West Vancouver, BC, Canada] Directional responses to water current by young rainbow trout fry, originating from seven parental stocks spawning in inlet or outlet streams of two British Columbia lakes, were studied in laboratory channels at three levels of temperature and two of illumination (light, dark). Intrastock and one complete 7 x 7 diallel cross were propagated for the experiment. The response of fry to water current was significantly affected by parental stock, illumination, and temperature. Significant genetic differences in current response scores were found among stocks in both light and dark trials. Mean upstream movement scores were generally higher for fry with outlet fathers than for those with inlet fathers. When data for the light and dark diallel experiments were combined, the mean difference in upstream movement scores between fry with outlet fathers and those with inlet fathers was 0.94 ± 0.26 which is significant at the 0.001 level. The corresponding mean difference between fry from outlet x outlet and inlet x inlet crosses was 1.34 ± 0.38 which is significant at the 0.0005 level. The interplay of genetic and environmental factors regulating lakeward migration of the young trout from the different types of parental spawning streams is discussed.

82-000188 Matsubara, J. A. ELECTROLOCATION IN WEAKLY ELECTRIC FISH: A NEUROETHOLOGICAL ANALYSIS. *Ph.D. dissertation, Univ. Calif. (San Diego)* 1980. From Diss. Abstr. Int. B Sci. Eng. 42(6):2247. Dec. 1981. SFA 27(1)

82-000189 Mazeaud, F. MORPHOLINE, A NONSPECIFIC ATTRACTANT FOR SALMONIDS. *Aquaculture* 26(1-2):189-191. Nov. 1981. SFA 27(1)
[Serv. Biochim.-Phys., Inst. Biol. Phys.-Chim., 13 rue Pierre et Marie Curie, 75 005, Paris, France] In a preliminary experiment on salmon ranching, we set up a trap on a secondary tributary of a river supposedly void of anadromous salmonids. Using morpholine as an attractant, we captured two rainbow trout, four sea trout and three Atlantic salmon, all these fish being sexually mature. Besides an imprinting mechanism, morpholine can act as a nonspecific attractant to non-imprinted fish.

82-000190 McKaye, K. R. FIELD OBSERVATION ON DEATH FEIGNING: A UNIQUE HUNTING BEHAVIOR BY THE PREDATORY CICHLID, *HAPLOCHROMIS LIVINGSTONI*, OF LAKE MALAWI. *Environ. Biol. Fishes* 6(3-4):361-365. 1 Nov. 1981. SFA 27(1)
[Dep. Biol., Yale Univ., P.O. Box 6666, New Haven, CT 06511]

82-000191 Moller, P. and T. Szabo. LESIONS IN THE NUCLEUS MESENCEPHALI EXTEROLATERALIS: EFFECTS ON ELECTROCOMMUNICATION IN THE MORMYRID FISH *GNATHONEMUS PETERSII* (MORMYRIFORMES). *J. Comp. Physiol. A Sens. Neural Behav. Physiol.* 144(3):327-333. Oct. 1981. SFA 27(1)
[Hunter Coll., New York, NY 10024]

82-000192 Nelson, D. O. and C. L. Prosser. TEMPERATURE-SENSITIVE NEURONS IN THE PREOPTIC REGION OF SUNFISH. *Am. J. Physiol.* 241(5):R259-R263. Nov. 1981. SFA 27(1)
[Dep. Physiol., Coll. Med., Ohio State Univ., Columbus 43210]

BEHAVIOR (CONTINUED)

82-000193 Nilsson, N. and T. G. Northcote. RAINBOW TROUT (*SALMO GAIRDNERI*) AND CUTTHROAT TROUT (*S. CLARKI*) INTERACTIONS IN COASTAL BRITISH COLUMBIA LAKES. *Can. J. Fish. Aquatic Sci.* 38(10):1228-1246. Oct. 1981. In English with French summ. SFA 27(1)
[Inst. Freshwater Res., S-170 11 Drottningholm, Sweden]

82-000194 Partridge, B. L. INTERNAL DYNAMICS AND THE INTERRELATIONS OF FISH IN SCHOOLS. *J. Comp. Physiol. A Sens. Neural Behav. Physiol.* 144(3):313-325. Oct. 1981. SFA 27(1)
[Dep. Biol., Univ. Miami, Coral Gables, FL 33124]

82-000195 Phillips, R. R. and S. B. Swears. DIEL ACTIVITY CYCLES OF TWO CHESAPEAKE BAY FISHES, THE STRIPED BLENNY (*CHASMODES BOSQUIANUS*) AND THE OYSTER TOADFISH (*OPSANUS TAU*). *Estuaries* 4(4):357-362. Dec. 1981. SFA 27(1)
[Biol. Dep., State Univ. Coll., Oneonta, NY 13820] Diel activity cycles of toadfish and striped blennies were identified in the laboratory by means of mechanoelectric detector units. Data for both species were collected over 72-h periods. Daytime and nighttime activity rates were compared statistically. In addition, five 3-h segments (3 during the day and 2 at night) were selected for statistical comparison. Both species are more active at night than during the day. The toadfish appears to be more strictly nocturnal than does the blenny, with the peak in its activity occurring in the 3-h segment following dusk. Blenny activity increases throughout the night, reaching a peak during the 3-h segment before dawn. It then ebbs to a low in the afternoon.

82-000196 Reynolds, W. W. and M. E. Casterlin. BEHAVIORAL THERMOREGULATORY ABILITIES OF TROPICAL CORAL REEF FISHES: A COMPARISON WITH TEMPERATE FRESHWATER AND MARINE FISHES. *Environ. Biol. Fishes* 6(3-4):347-349. 1 Nov. 1981. SFA 27(1)
[Mar. Biol. Prog., Univ. New England, Biddeford, ME 04005]

82-000197 Rimmer, D. M. ON THE AUTUMNAL HABITAT CHANGE OF JUVENILE ATLANTIC SALMON (*SALMO SALAR* L.). *Ph.D. dissertation, Univ. New Brunswick* 1980. From Diss. Abstr. Int. B Sci. Eng. 42(6):2214. Dec. 1981. SFA 27(1)

82-000198 Robertson, D. R.; S. G. Hoffman and J. M. Sheldon. AVAILABILITY OF SPACE FOR THE TERRITORIAL CARIBBEAN DAMSELFISH *EUPOMACENTRUS PLANIFRONS*. *Ecology* 62(5):1162-1169. Oct. 1981. SFA 27(1)
[Smithsonian Trop. Res. Inst., Box 2072, Balboa, Panama]

82-000199 Takahashi, M.; S. Murachi and S. Moriwaki. A FEEDING DEVICE FOR FISHES DESIGNED FOR EXPERIMENTAL USE. *Bull. Jpn. Soc. Sci. Fish.* 47(9):1131-1134. Sept. 1981. SFA 27(1)
[Fac. Appl. Biol. Sci., Hiroshima Univ., Fukuyama 720, Japan] A demand feeder was designed and constructed for use in the conditioning experiments of fishes, with special attention paid to four points; that (1) it should provide only one pellet when the release mechanism is activated by the fish, (2) its trigger can be activated even by very light touch of the fish, (3) it should be protected from the actions of fishes other than those desired, and (4) it should be possible to manually activate the feeder whenever needed. By using this device in conjunction with an electromechanical event recorder, a continuous record on the feeding activity of a bluegill sunfish for 10 days

BEHAVIOR (CONTINUED)

82-000199 CONTINUED was obtained. The observations revealed that the level of the feeding activity in the fish obtaining food from this device was much lower than that when the fish was fed by the experimenter.

82-000200 Takahashi, M.; S. Murachi; T. Sekitani; S. Moriwaki and T. Ogawa. FORMATION OF THE "BOBBER UPTHRUST RESPONSE" FOR FOOD-OBTAINING IN BLUEGILL SUNFISH *LEPOMIS MACROCHIRUS*. *Bull. Jpn. Soc. Sci. Fish.* 47(9):1135-1140. Sept. 1981. SFA 27(1)
[Fac. Appl. Biol. Sci., Hiroshima Univ., Fukuyama 720, Japan]

82-000201 Todd, G. T. EVOLUTION AND THE PROBLEM OF BUOYANCY IN CARTILAGINOUS AND BONY FISHES. *Ph.D. dissertation, Univ. Calif. (Los Angeles)* 114p. 1981. From Diss. Abstr. Int. B Sci. Eng. 42(5):1783. Nov. 1981. SFA 27(1)

82-000202 Tricas, T. C.; L. R. Taylor and G. Naftel. DIEL BEHAVIOR OF THE TIGER SHARK, *GALEOCERDO CUVIER*, AT FRENCH FRIGATE SHOALS, HAWAIIAN ISLANDS. *Copeia* 1981(4):904-908. 29 Dec. 1981. SFA 27(1)
[Dep. Zool., Univ. Hawaii, Honolulu 96822]

82-000203 Tsuchiya, A.; Y. Ohta; M. Nishimura and C. Miyazaki. CORRELATION ANALYSIS OF MAN-MADE UNDERWATER SOUND AND FISH BEHAVIOR. *J. Fac. Mar. Sci. Technol. Tokai Univ.* No. 14. p. 325-341. 1981. SFA 27(1)
[Fac. Mar. Sci. Technol., Tokai Univ., Shimizu, Japan 424]

82-000204 Webb, P. W. and R. S. Keyes. DIVISION OF LABOR BETWEEN MEDIAN FINS IN SWIMMING DOLPHIN (PISCES: CORYPHAENIDAE). *Copeia* 1981(4):901-904. 29 Dec. 1981. SFA 27(1)
[Sch. Nat. Resour., Univ. Mich., Ann Arbor 48109]

82-000205 Yamamoto, Y.; K. Hayama and S. Ikeda. [EFFECT OF DIETARY ASCORBIC ACID ON THE COPPER POISONING IN RAINBOW TROUT.] *Bull. Jpn. Soc. Sci. Fish.* 47(8):1085-1089. Aug. 1981. In Japanese with English summ. SFA 27(1)
[Dep. Food Sci., Fac. Home Econ., Kobe Coll., Nishinomiya 662, Japan]

82-000206 Yoshiyama, R. M. DISTRIBUTION AND ABUNDANCE PATTERNS OF ROCKY INTERTIDAL FISHES IN CENTRAL CALIFORNIA. *Environ. Biol. Fishes* 6(3-4):315-332. 1 Nov. 1981. SFA 27(1)
[Environ. Sci. Div., Oak Ridge Natl. Lab., Oak Ridge, TN 37830]

LIFE HISTORY-GENERAL WORKS

82-000207 Azuma, M. ON THE ORIGIN OF KAYU, A LANDLOCKED FORM OF AMPHIDROMOUS AYU-FISH, *PLECOGLOSSUS ALTIVELIS*. *Int. Ver. Theor. Angew. Limnol. Verh.* 21(Part 2):1291-1296. 1981. SFA 27(1)
[Biol. Lab., Fac. Educ., Nagasaki Univ., 1-14 Bunkyo-Machi, Nagasaki 852, Japan]

LIFE HISTORY-GENERAL WORKS (CONTINUED)

82-000208 Crane, J. M., Jr. FEEDING AND GROWTH BY THE SESSILE LARVAE OF THE TELEOST *PORICHTHYS NOTATUS*. *Copeia* 1981(4):895-897. 29 Dec. 1981. SFA 27(1)
[Dep. Biol., Cerritos Coll., Norwalk, CA 90650]

82-000209 Crateau, E. J.; P. A. Moon and C. M. Wooley. BIOLOGY, POPULATION DYNAMICS AND MANAGEMENT OF *MORONE*, SP., WITH EMPHASIS ON NATIVE GULF OF MEXICO RACE AND INTRODUCED ATLANTIC RACE STRIPED BASS, APALACHICOLA RIVER, FLORIDA. *U.S. Fish Wildl. Serv.* iv + 105p. 1981. SFA 27(1)
[U.S. FWS, 1612 June Ave., Panama City, FL 32405]

82-000210 Druzhinin, A. D. SOME DATA ON THE SHARKSUCKER, *ECHENEIS NAUCRATES* (ECHENEIDAE), FROM THE INDIAN OCEAN. *J. Ichthyol. (Engl. Trans. Vopr. Ikhtiol.)* 20(5):149-151. 1980. SFA 27(1)
[VNIRO, Moscow, USSR] *Echeneis naucrates* was caught in small numbers by trawls at a depth of 18-141m, mainly to a depth of 75m. The length of *E. naucrates* varied between 30.5 and 81.0 cm, the weight between 440 and 1,490g. *E. naucrates* probably spawns from January to April. *E. naucrates* is a zoophage, consuming molluscs, crustaceans and their larvae and small fish.--Concl.

82-000211 Garton, J. S.; L. L. Olmsted and T. J. Edwards. A STUDY OF THE RAINBOW TROUT (*SALMO GAIRDNERI*, RICHARDSON) IN HOWARD CREEK, OCONEE COUNTY, SOUTH CAROLINA. *Duke Power Co.* DUKEPWR/76-01. 24p. Mar. 1976. SFA 27(1)
[Duke Power Co., Charlotte, NC] Howard Creek is presently supporting a self-sustaining rainbow trout population. In addition, fingerlings are stocked annually. Fingerlings stocked in May 1975 dispersed downstream, but none were collected more than 900 m from their point of stocking. Their average total length increased from 90 mm in May to 135 mm in December 1975. Native trout grew faster, from an average total length of 40 mm in April to 120 mm in December. During their second year trout ranged in total length from 135 to 200 mm, and some were sexually mature. Few harvestable size trout (>200 mm) were collected. Insects were the most important food item of trout, with the Plecoptera being the predominant order. The Blacknose dace (*Rhinichythys atratulus*) was the only other fish commonly collected.

82-000212 Gibson, R. N. and I. A. Ezzi. THE BIOLOGY OF THE NORWAY GOBY, *POMATOSCHISTUS NORVEGICUS* (COLLETT), ON THE WEST COAST OF SCOTLAND. *J. Fish Biol.* 19(6):697-714. Dec. 1981. SFA 27(1)
[Dunstaffnage Mar., Res. Lab., Oban, Argyll, Scotland] The biology of the small offshore goby, *Pomatoschistus norvegicus* (Collett), was studied on the west coast of Scotland over a period of 19 months. Catches were highest in April-June and lowest in August-September. Virtually all growth takes place in the first two summers, very little in those fish surviving to a third summer. The fish mature after their first winter and the breeding season lasts from March-July. Fecundity is linearly related to standard length and varies from approximately 1000-4000 eggs. Approximately 75% of fish survive their first breeding season but all die after their second. Males live slightly longer than females. The diet consists mainly of amphipods and small caridean decapods. The life history of the species is compared with other members of the genus.

82-000213 Kracht, R. and F.-W. Tesch. PROGRESS REPORT ON THE EEL EXPEDITION OF R. V. 'ANTON DOHRN' AND R. V. 'FRIEDRICH HEINCKE' TO THE SARGASSO SEA 1979. *Environ. Biol. Fishes* 6(3-4):371-375. 1 Nov. 1981. SFA 27(1)
[Biol. Anst. Helgoland, D-2000 Hamburg 50, West Germany]

LIFE HISTORY-GENERAL WORKS (CONTINUED)

82-000214 Love, M. S. and W. V. Westphal. GROWTH, REPRODUCTION, AND FOOD HABITS OF OLIVE ROCKFISH, *SEBASTES SERRANOIDES*, OFF CENTRAL CALIFORNIA. *Fish. Bull.* 79(3):533-545. July 1981. SFA 27(1)
[Dep. Biol., Occidental Coll., 1600 Campus Rd., Los Angeles, CA 90041] We collected data on age-length and length-weight relationships, age at first maturity, spawning season, fecundity, and food habits of olive rockfish, *Sebastes serranoides*, off Diablo Cove, near Avila, California. Fish were aged from otoliths. Von Bertalanffy age-length parameters for females were $L\infty = 5.19$, $k = 0.18$, and $t_0 = -1.57$; for males $L\infty = 43.3$, $k = 0.27$, and $t_0 = -1.03$. Females grew at a faster rate than males beginning at the age where most males were mature. Age at first maturity ranged from 3 to 8 years, most fishes maturing by age 6. Olive rockfish spawned once per season, between December and March, with peak spawning in January. Fecundity ranged between 30,000 and 490,000 eggs. Small individuals preyed primarily on plankton, and larger ones concentrated on fishes, squids, and octopuses.

82-000215 O'Neil, P. E. LIFE HISTORY OF *ETHEOSTOMA COOSAE* (PISCES: PERCIDAE) IN BARBAREE CREEK, ALABAMA. *Tulane Stud. Zool. Bot.* 23(1):75-83. 30 Dec. 1981. SFA 27(1)
[Geol. Surv. Ala., P.O. Drawer O, University 35486] Collections of *Etheostoma coosae* (Coosa darter) were made from April 1977 to April 1978 in Barbaree Creek (Coosa River system), Clay County, Alabama. The principal habitat of this species was cobble and/or gravel raceways, riffles and pools. Spawning occurred on the surface of rocks and small boulders from mid March to late May with peak activity in mid April. The spawning position was either inclined or semi-inverted horizontally. Individuals reached sexual maturity and spawned by the first year. Maximum age was three years. By the end of the second year, the average size of males and females was 41.0 mm and 36.5 mm SL, respectively. The sex ratio, 1:1.3, was significantly different from 1:1. The principal diet consisted of Copepoda, Cladocera, Ephemeroptera (*Isonychia*) and Diptera (Chironomidae, Simuliidae).

82-000216 Palko, B. J.; G. L. Beardsley and W. J. Richards. SYNOPSIS OF THE BIOLOGY OF THE SWORDFISH, *XIPHIAS GLADIUS* LINNAEUS. *NOAA Tech. Rep. NMFS Circ.* 441. iv + 21p. Nov. 1981. SFA 27(1)
[NMFS, 75 Virginia Beach Dr., Miami, FL 33149]

82-000217 Smith, P. E.; J. R. Hunter; R. Lasker (ed.) and H. G. Moser. MARINE FISH LARVAE: MORPHOLOGY, ECOLOGY, AND RELATION TO FISHERIES. *Wash. Sea Grant Prog., Seattle* xiii + 131p. 30 Nov. 1981. Available @ $8.50 from Univ. Wash. Press, Seattle 98105]

82-000218 Stein, D. L. ASPECTS OF REPRODUCTION, EARLY LIFE HISTORY, AND BIOLOGY OF BATHYAL AND ABYSSAL LIPARIDIDAE AND MACROURIDAE (PISCES) OFF OREGON. *Ph.D. dissertaion, Oreg. State Univ.* 115p. 1982. From Diss. Abstr. Int. B Sci. Eng. 42(6):2178. Dec. 1981. SFA 27(1)

82-000219 Suzuki, K.; Y. Tanaka; S. Hioki and S. Ueno. [SPAWNING BEHAVIOR AND EARLY LIFE HISTORY OF *HYPODYTES RUBRIPINNIS* (PISCES: CONGIOPODIDAE) IN AN AQUARIUM.] *J. Fac. Mar. Sci. Technol. Tokai Univ.* No. 14. p. 357-367. 1981. In Japanese with English summ. SFA 27(1)
[Fac. Mar. Sci. Technol., Tokai Univ., Shimizu, Japan 424]

82-000220 Vostradovský, J. THE BIOLOGY (SIZE, GROWTH, FOOD) OF PIKE (*ESOX LUCIUS* L.) IN THREE CZECH RESERVOIRS. *Int. Ver. Theor. Angew. Limnol. Verh.* 21(Part 2):1264-1269. 1981. SFA 27(1)
[Res. Inst. Fish. Hydrobiol., Vodňany Res. Stn., 252 66 Libčice nad Vltavou, Czechoslovakia]

POPULATION STUDIES, PRODUCTION, RECRUITMENT, ETC.

82-000221 Cooper, M. J. and G. A. Wheatley. AN EXAMINATION OF THE FISH POPULATION IN THE RIVER TRENT, NOTTINGHAMSHIRE USING ANGLER CATCHES. *J. Fish Biol.* 19(5):539-556. Nov. 1981. SFA 27(1)
[Severn-Trent Water Auth., Area Fish. Off., Meadow Lane, Nottingham NG2 3HN, England] During this study, anglers caught over 580 kg of fish, comprising over 29,500 individuals of 14 species. Nine times as many gudgeon, *Gobio gobio*, as roach, *Rutilus rutilus*, were caught. Gudgeon represented 35.94% of the total catch weight compared with 44.64% for roach. The mean total catch per man-hour was 8.9 fish and the mean catch rate was 176 g per man-hour. Population estimates for fish longer than 12 cm for all species other than gudgeon and bleak, *Alburnus alburnus*, gave fish densities of 0.21 fish m^{-2}, the roach population was 0.15 m^{-2}, and that for dace *Leuciscus leuciscus*, 0.02 m^{-2}. The population density for all sizes of all species caught was estimated to be 2.25 fish m^{-2}. The fish biomass available to the angler was 447 kg ha^{-2}. The rate of exploitation of the fishery over the period of sampling was high at 17%, representing an annual exploitation rate of 94%.

82-000222 Gascon, D. and R. A. Miller. COLONIZATION BY NEARSHORE FISH ON SMALL ARTIFICIAL REEFS IN BARKLEY SOUND, BRITISH COLUMBIA. *Can. J. Zool.* 59(9):1635-1646. Sept. 1981. In English with French summ. SFA 27(1)
[Dep. Zool., Univ. Alberta, Edmonton, AB T6G 2E9, Canada]

82-000223 Gjøsæter, J. ABUNDANCE AND PROTECTION OF LANTERNFISH (MYCTOPHIDAE) IN THE WESTERN AND NORTHERN ARABIAN SEA. *Fiskeridir. Skr. Ser. Havunders.* 17(6):215-251. 1981. SFA 27(1)
[Dep. Fish. Biol., Univ. Bergen, Norway]

82-000224 Jensen, A. L. POPULATION REGULATION IN LAKE WHITEFISH, *COREGONUS CLUPEAFORMIS* (MITCHILL). *J. Fish Biol.* 19(5):557-573. Nov. 1981. SFA 27(1)
[Sch. Nat. Resour., Univ. Mich., Ann Arbor 48109] Mechanisms that might compensate for changes in mortality are well known but documentation of their operation and determination of their relative capacities is difficult. In this study the potential of lake whitefish to compensate for fishing mortality is quantified using a conventional fishery stock assessment model. The mechanisms examined are proportion of females, fecundity, survival of eggs and larvae, decrease in age at maturity and growth. The change in each of these parameters necessary to maintain constant recruitment with increasing fishing pressure is determined. Decrease in age of maturity and increased survival of larvae and eggs have the greatest potential for compensation. The total capacity for compensation appears large even when the mechanisms are considered alone. A review of several lake whitefish population studies indicates a large variation in the vital statistics. There is a close relation between total mortality and growth. There is also a close relation between growth and age at maturity. The analyses indicate that increased fishing results in increased growth which then results in a lower age at maturity. This feedback mechanism enables lake whitefish to respond to changes in environmental conditions and on average to maintain a birth rate in balance with mortality.

82-000225 Lewis, G. E. and R. G. Morris. STANDING CROP OF FISH IN A SMALL WEST VIRGINIA FLOOD CONTROL IMPOUNDMENT. *Prog. Fish.-Cult.* 43(4):222. Oct. 1981. SFA 17(1)
[W.Va. Dep. Nat. Resour., Drawer C, Romney 26757]

POPULATION STUDIES, PRODUCTION, RECRUITMENT, ETC. (CONTINUED)

82-000226 Mais, K. F. AGE-COMPOSITION CHANGES IN THE ANCHOVY, *ENGRAULIS MORDAX*, CENTRAL POPULATION. *Calif. Coop. Oceanic Fish. Invest. Rep.* 22:82-87. Oct. 1981. SFA 27(1)
[Calif. Dep. Fish Game, 350 Golden Shore, Long Beach 90802]

82-000227 Martin, F. D. and M. Cooper. A COMPARISON OF FISH FAUNAS FOUND IN PURE STANDS OF TWO TROPICAL ATLANTIC SEAGRASSES, *THALASSIA FESTUDINUM* AND *SYRINGODIUM FILIFORME*. *Northeast Gulf Sci.* 5(1):31-37. Oct. 1981. SFA 27(1)
[Univ. Md., Chesapeake Biol. Lab., Solomons 20788]

82-000228 Mathisen, O. A. and P. H. Poe. SOCKEYE SALMON CYCLES IN THE KVICHAK RIVER, BRISTOL BAY, ALASKA. *Int. Ver. Theor. Angew. Limnol. Verh.* 21(Part 2):1207-1213. 1981. SFA 27(1)
[Fish. Res. Inst., Coll. Fish., Univ. Wash., Seattle 98195]

82-000229 Randall, R. G. PRODUCTION RATE OF JUVENILE ATLANTIC SALMON (*SALMO SALAR* LINNAEUS) IN RELATION TO AVAILABLE FOOD IN TWO MIRAMICHI RIVER, N.B. NURSERY STREAMS. *Ph.D. dissertation, Univ. New Brunswick* 1981. From Diss. Abstr. Int. B Sci. Eng. 42(6):2187. 1981. SFA 27(1)

82-000230 Sale, P. F. and W. A. Douglas. PRECISION AND ACCURACY OF VISUAL CENSUS TECHNIQUE FOR FISH ASSEMBLAGES ON CORAL PATCH REEFS. *Environ. Biol. Fishes* 6(3-4):333-339. 1 Nov. 1981. SFA 27(1)
[Sch. Biol. Sci., Univ. Sydney, Sydney, N.S.W. 2006, Australia] A visual census technique is described in which the results of three separate enumerations of fish at a site are combined to produce a "best estimate" of the fish fauna present. Its precision and accuracy are examined, and compared to those of censuses obtained by modifications of the technique. Visual censuses can display high repeatability, but they seldom (if ever) completely sample the fish present at a site. Accuracy varies with technique used. In our tests, the preferred method yielded 82% of species and 75% of individuals known to be present and potentially censusable at the time the observations were made. Visual censuses are of comparable accuracy to ichthyocide collections of unenclosed sites, but the two methods sample different components of the total fish fauna. It is important when using visual censuses to remember that their accuracy is not 100%.

82-000231 Stauffer, G. D. and S. J. Picquelle. ESTIMATE OF THE SPAWNING BIOMASS OF THE NORTHERN ANCHOVY CENTRAL SUBPOPULATION FOR THE 1980-81 FISHING SEASON. *Calif. Coop. Oceanic Fish. Invest. Rep.* 22:8-13. Oct. 1981. SFA 27(1)
[NMFS, Southwest Fish. Cent., La Jolla, CA 92038]

82-000232 Sunada, J. S.; P. R. Kelly; I. S. Yamashita and F. Gress. THE BROWN PELICAN AS A SAMPLING INSTRUMENT OF AGE GROUP STRUCTURE IN THE NORTHERN ANCHOVY POPULATION. *Calif. Coop. Oceanic Fish. Invest. Rep.* 22:65-68. Oct. 1981. SFA 27(1)
[Calif. Dep. Fish Game, 350 Golden Shore, Long Beach 90802]

82-000233 Taylor, W. W.; M. N. Točko and S. D. Gerking. POPULATION CHARACTERISTICS OF THE OHRID RIFLE MINNOW, *ALBURNOIDES BIPUNCTATUS OHRIDANUS* (KARAMAN), IN LAKE OHRID, YUGOSLAVIA. *Int. Ver. Theor. Angew. Limnol. Verh.* 21(Part 2):1283-1286. 1981. SFA 27(1)
[Dep. Fish. Wildl., Mich. State Univ., East Lansing 48824]

POPULATION STUDIES, PRODUCTION, RECRUITMENT, ETC. (CONTINUED)

82-000234 Thompson, J. M. PRELIMINARY REPORT ON THE POPULATION BIOLOGY AND FISHERY OF WALLEYE POLLOCK (*THERAGRA CHALCOGRAMMA*) OFF THE PACIFIC COAST OF CANADA. *Can. Tech. Rep. Fish. Aquatic Sci.* No. 1031. v + 157p. Aug. 1981. In English with French summ. SFA 27(1)
[Dep. Fish. Oceans, Pac. Biol. Stn., Nanaimo, BC V9R 5K6, Canada]

82-000235 Tormosova, I. D. FORECASTING OF YEAR-CLASS STRENGTH IN THE NORTH SEA HADDOCK, *MELANOGRAMMUS AEGLEFINUS*, FROM SPAWNING EFFECTIVENESS. *J. Ichtyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):152-155. 1980. SFA 27(1)
[AtlantNIRO, Kaliningrad, USSR] The strength of haddock year-classes is formed in the egg stage. The abundance of larvae depends on the number of eggs which have survived. The equations of linear regression between the strength of recruitment and the number of eggs and larvae which have survived may be used to forecast the strength of haddock year-classes over 2 years.--Concl.

82-000236 Zuyev, G. V. and V. N. Nikol'skiy. PROCEDURE FOR THE QUANTITATIVE RECORDING OF FLYINGFISHES (EXOCOETIDAE). *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):147-149. 1980. SFA 27(1)
[INVYuM, Ukrainian Acad. Sci., Sevastopol, USSR]

SPAWNING HABITS AND MOVEMENTS, FECUNDITY, ETC.

82-000237 Álvarez-Lajonchere, L. ALGUNOS ASPECTOS SOBRE LA REPRODUCCIÓN DE *MUGIL LIZA* (PISCES: MUGILIDAE) EN TUNAS DE ZAZA, CUBA. [SOME ASPECTS OF REPRODUCTION OF *MUGIL LIZA* (PISCES: MUGILIDAE) IN TUNAS DE ZAZA, CUBA.] *Riv. Cubana Invest. Pesq.* 4(2):25-61. 1979. In Spanish with English summ. SFA 27(1)
[Cent. Invest. Pesq., Ave. 1ra. y 26, Miramar, Ciudad Habana, Cuba]

82-000238 Banerji, S. R. and N. K. Thakur. OBSERVATIONS ON THE SPAWNING BEHAVIOUR OF *ANABAS TESTUDINEUS* (BLOCH). *Indian J. Anim. Sci.* 51(6):651-654. 1981. SFA 27(1)
[Fish. Res., Bihar, India] The spawning behaviour of *Anabas testudineus* observed while breeding fish through hypophysation is described. For hypophysation, pituitary glands of the Indian major carp (*Labeo rohita*) were used at 2mg/100 g weight of recipient. Spawning act commenced 6 to 28hr after the injection. The mating acts occurred intermittently at intervals of 2 to 10 min, and there were 20 to 30 matings in different sets spread over 3 to 4 hr. The eggs were released in batches of 20 to 30. The role of second male in the breeding sets was examined. The second male contributed significantly in the overall spawning success. It not only hastened the spawning process but was actually involved in mating at the later phase.

82-000239 Bauer, J. A., Jr. and S. E. Bauer. REPRODUCTIVE BIOLOGY OF PIGMY ANGELFISHES OF THE GENUS *CENTROPYGE* (POMACANTHIDAE). *Bull. Mar. Sci.* 31(3):495-513. July 1981. SFA 27(1)
[7225 Old Oak Blvd., Suite 3G, Cleveland, OH 44130]

82-000240 Chebanov, N. A. SPAWNING BEHAVIOR OF THE PINK SALMON, *ONCORHYNCHUS GORBUSCHA*. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):64-73. 1980. SFA 27(1)
[KoTINRO, Petropavlovsk-Kamchatskiy, USSR] The spawning behavior of the pink salmon, *Oncorhynchus gorbuscha*, has been studied in a limited area of the spawning grounds (Karymayskiy spring, Bol'shaya River basin, W.

SPAWNING HABITS AND MOVEMENTS, FECUNDITY, ETC. (CONTINUED)

82-000240 CONTINUED Kamchatka). The spawning contribution of small males is less than that of large males. Once the spawning area has been selected, females make few movements from it, which helps to protect the redds aginst excavation by other fishes. When the sex ratio is equal there is a real trend toward the selection of spawners of similar size at spawning time. Only the largest males may attend large and small females with equal frequency.

82-000241 Chen, C.; T. Taniuchi and Y. Nose. SOME ASPECTS OF REPRODUCTION IN THE POINTED-SNOUT DOGFISH *SQUALUS JAPONICUS* TAKEN OFF NAGASAKI AND CHOSHI. *Bull. Jpn. Soc. Sci. Fish.* 47(9):1157-1164. Sept. 1981. SFA 27(1)
[Dep. Fish., Natl. Taiwan Coll. Mar. Sci. Technol., Keelung, Taiwan, ROC]

82-000242 Ciechomski, J. D. de; C. A. Lasta; R. P. Sánchez and M. D. Ehrlich. DISTRIBUCIÓN DE HUEVOS Y LARVAS DE MERLUZA (*MERLUCCIUS HUBBSI*) EN EL MAR ARGENTINO EN DIFERENTES EPOCAS DEL AÑO Y EVALUACIÓN DE SUS EFECTIVOS DE ADULTOS DESOVANTES. [DISTRIBUTION OF EGGS AND LARVAE OF THE HAKE (*MERLUCCIUS HUBBSI*) IN THE SEA OFF ARGENTINA IN DIFFERENT SEASONS OF THE YEAR AND ASSESSMENT OF ITS SPAWNING STOCKS.] *Argentina Inst. Nac. Invest. Desar. Pesq. Contrib.* No. 380. 12p. Dec. 1979. In Spanish with English summ. SFA 27(1)
[Nac. Invest. Desar. Pesq., Casilla de Correo 175, 7600 Mar del Plata, Argentina]

82-000243 Ciechomski, J. D. de.; R. P. Sanchez; M. D. Ehrlich and C. A. Lasta. DISTRIBUCIÓN DE HUEVOS Y LARVAS DE ANCHOITA (*ENGRAULIS ANCHOITA*) EN EL MAR ARGENTINO EN DIFERENTES EPOCAS DEL AÑO Y EVALUACIÓN DE SUS EFECTIVOS DE ADULTOS DESOVANTES. [DISTRIBUTION OF EGGS AND LARVAE OF ANCHOVY, (*ENGRAULIS ANCHOITA*) IN THE SEA OFF ARGENTINA IN DIFFERENT SEASONS OF THE YEAR AND ASSESSMENT OF ITS SPAWNING STOCKS.] *Argentina Inst. Nac. Invest. Desar. Pesq. Contrib.* No. 379. 14p. Nov. 1979. In Spanish with English summ. SFA 27(1)
[Nac. Invest. Desar. Pesq., Casilla de Correo 175, 7600 Mar del Plata, Argentina]

82-000244 De Martini, E. E. and R. K. Fountain. OVARIAN CYCLING FREQUENCY AND BATCH FECUNDITY IN THE QUEENFISH, *SERIPHUS POLITUS*: ATTRIBUTES REPRESENTATIVE OF SERIAL SPAWNING FISHES. *NOAA Fish. Bull.* 79(3):547-560. July 1981. SFA 27(1)
[Mar. Sci. Inst., Univ. Calif., Santa Barbara 93106]

82-000245 Fadeyeva, T. A. MALE GONAD DEVELOPMENT AND THE SIZE-AGE COMPOSITION OF THE CASPIAN SEVRYUGA, *ACIPENSER STELLATUS*, DURING THE MARINE PERIOD OF LIFE. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):54-64. 1980. SFA 27(1)
[VNIRO, Moscow, USSR]

82-000246 Francis, M. P. SPAWNING MIGRATION OF MOKI (*LATRIDOPSIS CILIARIS*) OFF EASTERN NEW ZEALAND. *N.Z. J. Mar. Freshwater Res.* 15(3):267-273. 1981. SFA 27(1)
[Fish. Res. Div., Minist. Agric. Fish., P.O. Box 297, Wellington, New Zealand]

82-000247 Goldberg, S. R. SEASONAL SPAWNING CYCLE OF THE BLACK CROAKER, *CHEILOTREMA SATURNUM* (SCIAENIDAE). *NOAA Fish. Bull.* 79(3):561-562. July 1981. SFA 27(1)
[Dep. Biol., Whittier Coll., Whittier, CA 90608]

SPAWNING HABITS AND MOVEMENTS, FECUNDITY, ETC. (CONTINUED)

82-000248 Kroll, W. THE BEHAVIOR OF THE AFRICAN KILLIFISH, *APHYOSEMION GARDNERI*: NORMATIVE STUDIES. *Environ. Biol. Fishes* 6(3-4):277-284. 1 Nov. 1981. SFA 27(1)
[Dep. Biol., Loyola Univ. Chicago, 6525 N. Sheridan Rd., Chicago, IL 60626]

82-000249 Laudien, H. and V. Schlieker. TEMPERATURE DEPENDENCE OF COURTSHIP BEHAVIOUR IN THE MALE GUPPY, *POECILIA RETICULATA*. *J. Therm. Biol.* 6(4):307-314. Oct. 1981. SFA 27(1)
[Dep. Zool., Univ. Kiel, D-2300 Kiel, West Germany]

82-000250 Lisovenko, L. A. THE FECUNDITY OF THE GRENADIER, *CORYPHAENOIDES HOLOTRACHYS*, FROM THE FALKLAND-PATAGONIAN REGION IN RELATION TO LENGTH AND WEIGHT. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):158-160. 1980. SFA 27(1)
[VNIRO, Moscow, USSR]

82-000251 Maruyama, T. [COMPARATIVE ECOLOGY ON THE FLUVIAL FORMS OF *SALMO (ONCORHYNCHUS) MASOU MASOU* (BREVOORT) AND *SALVELINUS LEUCOMAENIS* (PALLAS) (PISCES, SALMONIDAE) I. STRUCTURE OF SPAWNING REDDS AND SPAWNING SITES IN KAMIDANI, RIVER YURA. *Jpn. J. Ecol.* 31(3):269-284. Sept. 1981. In Japanese with English summ. SFA 27(1)
[Res. Lab., Fish. Resour., Tokyo Univ., Tokyo 108, Japan]

82-000252 Middaugh, D. P. REPRODUCTIVE ECOLOGY AND SPAWNING PERIODICITY OF THE ATLANTIC SILVERSIDE, *MENIDIA MENIDIA* (PISCES: ATHERINIDAE). *Copeia* 1981(4):766-776. 29 Dec. 1981. SFA 27(1)
[Gulf Breeze Environ. Res. Lab., Sabine Island, Gulf Breeze, FL 32561]

82-000253 Middaugh, D. P.; G. I. Scott and J. M. Dean. REPRODUCTIVE BEHAVIOR OF THE ATLANTIC SILVERSIDE, *MENIDIA MENIDIA* (PISCES, ATHERINIDAE). *Environ. Biol. Fishes* 6(3-4):269-276. 1 Nov. 1981. SFA 27(1)
[U.S. EPA, Gulf Breeze Environ. Res. Lab., Sabine Island, Gulf Breeze, FL 32561] The spawning behavior of the Atlantic silverside, *Menidia menidia*, was studied at two sites on the North Edisto River estuary in South Carolina. Prespawning schools moved back and forth along the shoreline as the time of high tide approached. Spawning runs took place in the upper intertidal zone at high tide. Spawning fish deposited their eggs on three types of substrates: 1) the lower stems of cordgrass plants, *Spartina alterniflora*, 2) detrital mats, and 3) exposed cordgrass roots along erosional scraps. Spawning behavior during egg deposition and fertilization was similar for all three substrates. Females released eggs during a rapid fluttering motion of the posterior half of the body. A similar movement accompanied release of sperm by males. Behavior of fish just prior to spawning insured deposition of gametes at locations that provided protection from thermal and drying stress during development. Eggs were deposited at mean intertidal elevations of 1.8 and 1.5 meters above mean low water (MLW) at respective study sites. They were exposed to the atmosphere for approximately ten hours between successive high tides. During spawning runs in which eggs were deposited at the base of cordgrass plants, ambient dissolved oxygen concentrations of the water in the spawning area were sometimes reduced to <1.0 mg. l^{-1}. Spent fish, apparently incurring an oxygen debt while spawning, formed a nonschooling aggregation offshore from the spawning zone. The recurrent use of specific spawning substrates for egg deposition resulted in an uneven distribution of spawning runs along the shoreline at each study site.

SPAWNING HABITS AND MOVEMENTS, FECUNDITY, ETC. (CONTINUED)

82-000254 Moreau, G. STRATÉGIE DE REPRODUCTION CHEZ LES POPULATIONS NORDIQUES DE GRANDS CORÉGONES (*COREGONUS CLUPEAFORMIS*). [REPRODUCTION STRATEGY OF NORTHERN POPULATIONS OF LAKE WHITEFISH (*COREGONUS CLUPEAFORMIS*). *Int. Ver. Theor. Angew. Limnol. Verh.* 21(Part 2):1251-1256. 1981. In French. with English summ. SFA 27(1)
[Univ. Laval, Dep. Biol., Cité Univ., Quebec, PQ G1K 7P4, Canada]

82-000255 Nakatani, T. and T. Maeda. TRANSPORT PROCESS OF THE ALASKA POLLACK EGGS IN FUNKA BAY AND THE ADJACENT WATERS, HOKKAIDO. *Bull. Jpn. Soc. Sci. Fish.* 47(9):1115-1118. Sept. 1981. SFA 27(1)
[Fac. Fish., Hokkaido Univ., Minato-3, Hakodate 041, Japan]

82-000256 Ottaway, E. M.; P. A. Carling; A. Clarke and N. A. Reader. OBSERVATIONS ON THE STRUCTURE OF BROWN TROUT, *SALMO TRUTTA* LINNAEUS, REDDS. *J. Fish Biol.* 19(5):593-607. Nov. 1981. SFA 27(1)
[Freshwater Biol. Assoc., Ferry House, Ambleside, Cumbria LA22 0LP, England] This paper describes the gravel type and structure of brown trout spawning gravels in Teesdale, the flow characteristics of the spawning sites and the size of redds. Factors influencing redd size are investigated and it is concluded that female size is a major factor. Relationships are established between various redd characteristics and the fork length of female fish. The findings are discussed in relation to the existing literature concerning salmonid spawning sites.

82-000257 Reed, J. K. and R. G. Gilmore. INSHORE OCCURRENCE AND NUPTIAL BEHAVIOR OF THE ROUGHTAIL STRINGRAY, *DASYATIS CENTROURA* (DASYATIDAE), ON THE CONTINENTAL SHELF, EAST CENTRAL FLORIDA. *Northeast Gulf Sci.* 5(1):59-62. Oct. 1981. SFA 27(1)
[Harbor Beach Found., Inc., RR 1, Box 196, Fort Pierce, FL 33450]

82-000258 Samarakoon, J. I. PARENTAL BEHAVIOR AND ECOLOGY OF THE ASIAN CICHLIDS *ETROPLUS SURATENSIS* AND *ETROPLUS MACULATUS*. *Ph.D. dissertation, Ill. State Univ.* 348p. 1981. From Diss. Abstr. Int. B Sci. Eng. 42(5):1782. Nov. 1981. SFA 27(1)

82-000259 Teskeredzic, Z. THE SPAWNING OF THE SARDINE (*SARDINA PILCHARDUS* [WALB.]) IN THE KVARNER REGION OF THE ADRIATIC SEA. *Thalassia Jugosl.* 14(3-4):323-338. 1978. SFA 27(1)
[Cent. Mar. Res., Ruder Bošković Inst., Zagreb, Yugoslavia] In the North Adriatic, in the Kvarner Region, which includes the Gulf of Rijeka examinations were carried out to investigate the presence of planktonic eggs in the spawning season 1972/1973. The field observations were performed once or twice a month, at 12 stations. The samples were taken by vertical tows with a modified Helgoland type plankton net, with an aperature of 0.5 m^2, from the depth of 30 m towards the surface. The material was preserved in 2.5% neutralized formaldehyde. During each field trip, some hydrographical data (temperature and salinity) at each station were also taken. The results confirm the known fact that the sardine spawns in the Northern Adriatic in the period between November and June. The maximum quantities of sardine eggs were obtained in November and in April when the spawning of sardine reached its first and second maximum, respectively. The most intensive spawning of the sardine took place in the southern part of Kvarner, at a temperature of 11.6-11.7°C and at a salintiy of 33.08-38.17 ‰.

MOVEMENTS, SEASONAL AND DEPTH DISTRIBUTION, ETC.

82-000260 Marsh, A. C. and A. J. Ribbink. A COMPARISON OF THE ABILITIES OF

MOVEMENTS, SEASONAL AND DEPTH DISTRIBUTION, ETC. (CONTINUED)

82-000260 CONTINUED THREE SYMPATRIC SPECIES OF *PETROTILAPIA* (CICHLIDAE, LAKE MALAWI) TO PENETRATE DEEP WATER. *Environ. Biol. Fishes* 6(3-4):367-369. 1 Nov. 1981. SFA 27(1)
[J. L. B. South Inst. Ichthyology, Rhodes Univ., Grahamstown 6140, South Africa]

82-000261 Neves, R. J. OFFSHORE DISTRIBUTION OF ALEWIFE, *ALOSA PSEUDOHARENGUS*, AND BLUEBACK HERRING, *ALOSA AESTIVALIS*, ALONG THE ATLANTIC COAST. *NOAA Fish. Bull.* 79(3):473-485. July 1981. SFA 27(1)
[Va. Coop. Fish. Res. Unit., 106 Cheatham Hall, VPI&SU, Blacksburg, VA 24061]

82-000262 Thorpe, J. E.; L. G. Ross; G. Struthers and W. Watts. TRACKING ATLANTIC SALMON SMOLTS, *SALMO SALAR* L., THROUGH LOCH VOIL, SCOTLAND. *J. Fish Biol.* 19(5):519-537. Nov. 1981. SFA 27(1)
[Freshwater Fish. Lab., Pitlochry, Scotland]

82-000263 Todd, P. R. TIMING AND PERIODICITY OF MIGRATING NEW ZEALAND FRESHWATER EELS (*ANGUILLA* SPP.). *N.Z. J. Mar. Freshwater Res.* 15(3):225-235. 1981. SFA 27(1)
[Fish. Res. Div., Minist. Agric. Fish., Private Bag, Christchurch, New Zealand]

82-000264 Wahle, R. J.; E. Chaney and R. E. Pearson. AREAL DISTRIBUTION OF MARKED COLUMBIA RIVER BASIN SPRING CHINOOK SALMON RECOVERED IN FISHERIES AND AT PARENT HATCHERIES. *Mar. Fish. Rev.* 43(12):1-9. Dec. 1981. SFA 27(1)
[NMFS, P.O. Box 4332, Portland, OR 97208]

FOODS/FEEDING

82-000265 Adámek, Z. and T. D. Sanh. THE FOOD OF GRASS CARP FRY (*CTENOPHARYNGODON IDELLA*) IN SOUTHERN MORAVIAN FINGERLING PONDS. *Folia Zool.* 30(3):263-270. 1981. In English with Russian summ. SFA 27(1)
[Dep. Fish. Water Prot., Univ. Agric., Brno, Czechoslovakia] The authors preformed food analyses in 114 fingerlings of grass carp, ranging from 29 to 82mm in size. The major food components included zooplankton (*Cladocera, Rotatoria, Copepoda*), zoobenthos (*Chironomidae* and *Ephemeroptera*), plants (macrovegetation and filamentous algae), and detritus. The filling of digestive tracts decreased with decreasing water temperature; below 10°C the food was consumed only sporatically.

82-000266 Brusven, M. A. and S. T. Rose. INFLUENCE OF SUBSTRATE COMPOSITION AND SUSPENDED SEDIMENT ON INSECT PREDATION BY THE TORRENT SCULPIN, *COTTUS RHOTHEUS*. *Can. J. Fish. Aquatic Sci.* 38(11):1444-1448. Nov. 1981. SFA 27(1)
[Dep. Entomol., Univ. Idaho, Moscow, 83843]

82-000267 Clady, M. D. SURVIVAL AND SHIFTS IN FOOD OF YOUNG-OF-YEAR *MICROPTERUS* PENNED AT HIGH DENSITIES IN AN OKLAHOMA POND. *Proc. Okla. Acad. Sci.* 61:15-22. 1981. SFA 27(1)
[Okla. Coop. Fish. Res. Unit, Okla. State Univ., Stillwater 74074]

FOODS/FEEDING (CONTINUED)

82-000268 Darcy, G. H. FOOD HABITS OF THE CRESTED GOBY, *LOPHOGOBIUS CYPRINOIDES*, IN TWO DADE COUNTY, FLORIDA, WATERWAYS. *Bull. Mar. Sci.* 31(4):928-932. Oct. 1981. SFA 27(1)
[Rosenstiel Sch. Mar. Atmos. Sci., Univ. Miami, 4600 Rickenbacher Causeway, Miami, FL 33149]

82-000269 Dill, L. M.; R. C. Ydenberg and A. H. G. Fraser. FOOD ABUNDANCE AND TERRITORY SIZE IN JUVENLILE COHO SALMON (*ONCORHYNCHUS KISUTCH*). *Can. J. Zool.* 59(9):1801-1809. Sept. 1981. In English with French summ. SFA 27(1)
[Dep. Biol. Sci., Simon Fraser Univ., Burnaby, BC V5A 1S6, Canada] Feeding territory size and potential food abundance were measured simultaneously in a field population of juvenile (40-50 mm) coho salmon. Territory size was inversely related to the density of benthic food on the territory, as predicted from an energy-based model of territoriality. The relationship between the abundance of drift food and territory size was in the predicted direction, but was not significant. Territories were also smaller where intruder pressure was higher, but intrusion rate and food abundance were not directly correlated. Therefore, the effect of food abundance on territory size was not caused indirectly by attraction of nonterritorial fish to areas where food was abundant. In the laboratory, the distance from which a resident coho attacked an approaching model intruder increased asymptotically with hunger. The fish therefore appear to possess an appropriate behavioural mechanism (tactic) to adjust territory size to local food abundance.

82-000270 Eie, J. A. and R. Borgstrøm. DISTRIBUTION AND FOOD OF ROACH [*RUTILUS RUTILUS* (L.)] AND PERCH (*PERCA FLUVIATILIS* L.) IN THE EUTROPHIC LAKE ÅRUNGEN, NORWAY. *Int. Ver. Theor. Angew. Limnol. Verh.* 21(Part 2):1257-1263. 1981. SFA 27(1)
[Inst. Nat. Conserv., Agric. Univ. Norway, P.O. Box 39, N-1432 Ås-NLH, Norway]

82-000271 Janssen, J. and G. R. Harbison. FISH IN SALPS: THE ASSOCIATION OF SQUARETAILS (*TETRAGONURUS* SPP.) WITH PELAGIC TUNICATES. *J. Mar. Biol. Assoc. U.K.* 61(4):917-927. Nov. 1981. SFA 27(1)
[Biol. Dep., Loyola Univ., 6525 North Sheridan Rd., Chicago, IL 60626] *Tetragonurus* is a rarely collected genus of stromateoid fishes from the open ocean found widely in tropical and temperate regions. SCUBA divers have collected the young of all three species (*T. cuvieri*, *T. atlanticus* and *T. pacificus*) living inside salps. The fishes use their unusual dentition to bite off parts of salps and pyrosomes. They enter salps via the atrial opening and, while inside, eat the salps' gut and gill bar. Comsumption of the gut from outside the salp is hampered by a tough shield around the gut, the arrangement of individual salps in a colony, and processes from the salps' tests. The fish also consume test processes from *Pyrosoma* colonies and enter into the cloacal chambers. The morphology and behaviour of *Tetragonurus* provide convincing evidence that these fishes are specifically adapted for life in association with pelagic tunicates. The present study, and observations on other pelagic and planktonic organisms, indicate that associations such as this are common in the open ocean.

82-000272 Konchina, Yu. V. THE PERUVIAN JACK MACKEREL, *TRACHURUS SYMMETRICUS MURPHYI*, A FACULTATIVE PREDATOR IN THE COASTAL UPWELLING ECOSYSTEM. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):46-59. 1980. SFA 27(1)
[VNIRO, Moscow, USSR]

82-000273 Kornilova, G. N. FEEDING OF YELLOWFIN TUNA, *THUNNUS ALBACARES*, AND BIGEYE TUNA, *THUNNUS OBESUS*, IN THE EQUATORIAL ZONE OF THE INDIAN OCEAN. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)*

FOODS/FEEDING (CONTINUED)

82-000273 CONTINUED 20(6):111-119. 1980. SFA 27(1)
[AZCherNIRO, Kerch, USSR] A study was made of the feeding of yellowfin tuna, *Thunnus albacares*, and the bigeye tuna, *T. obesus*, caught during the summer in the equatorial zone of the Indian Ocean, from areas in which tunas had high indices of fullness. Fish is the greatest percentage by weight in the food of tunas; cephalopods and crustaceans account for smaller percentages. In some parts of the zone there are various combinations of forage organisms with 1-2 dominant organisms in the food of tunas. Competition for the same prey is reduced in the 2 tuna species by feeding at different depths.

82-000274 Luecke, C. and W. J. O'Brien. PREY LOCATION VOLUME OF A PLANKTIVOROUS FISH: A NEW MEASURE OF PREY VULNERABILITY. *Can. J. Fish. Aquatic Sci.* 38(10):1264-1270. Oct. 1981. In English with French summ. SFA 27(1)
[Dep. Syst. Ecol., Univ. Kans., Lawrence 66045]

82-000275 Lundberg, B. ALGAL VEGETATION AND ALGAE AS A FISH DIET AT TWO BASINS IN THE GULF OF ELAT (AQABA). *Bull. Mar. Sci.* 31(3):810. July 1981. Abstract only. SFA 27(1)

82-000276 McCrone, L. E. DIEL VERTICAL MIGRATION AND FEEDING BEHAVIOR OF SOME MESOPELAGIC FISHES IN THE EASTERN SUBARCTIC PACIFIC OCEAN. *Ph.D. dissertation, Univ. Wash.* 225p. 1981. From Diss. Abstr. Int. B Sci. Eng. 42(6):2177. Dec. 1981. SFA 27(1)

82-000277 Medved, R. J. and J. A. Marshall. FEEDING BEHAVIOR AND BIOLOGY OF THE YOUNG SANDBAR SHARKS, *CARCHARHINUS PLUMBEUS* (PISCES, CARCHARHINIDAE), IN CHINCOTEAGUE BAY, VIRGINIA. *NOAA Fish. Bull.* 79(3):441-447. July 1981. SFA 27(1)
[Grad. Sch. Oceanogr., Univ. R.I., Kingston 02881] During the summers of 1977, 1978, and 1979 the feeding behavior and biology of young sandbar sharks were investigated in Chinocoteague Bay, Virginia, using catch data obtained from rod and reel fishing. Mean catch per unit effort for the study was 1.02 sharks per hour, but yearly differences in catch per unit effort were found. Sandbar sharks were not caught before the first week in June despite substantial fishing effort prior to this time, both in 1977 and 1978. Catch per unit effort was higher at night than during the day but was not related to tidal current stage or speed. Captures were made at surface, mid, and bottom fishing depths. During the day, catch per unit effort was highest at the bottom fishing depth but did not differ among the three depths during the night. The blue crab, *Callinectes sapidus*, was found in 41.3% of the stomachs examined; 20% of the stomachs were empty, and the remainder contained various crustaceans and fishes. The proportion of empty or nearly empty stomachs was greater for night captures than for day captures. Yearly differences in sex ratio existed and the total length distribution of sharks measured suggested the presence of relatively distinct size classes.

82-000278 Naughton, S. P. and C. H. Saloman. STOMACH CONTENTS OF JUVENILES OF KING MACKEREL (*SCOMBEROMORUS CAVALLA*) AND SPANISH MACKEREL (*S. MACULATUS*). *Northeast Gulf Sci.* 5(1):71-74. Oct. 1981. SFA 27(1)
[NMFS, 3500 Delwood Beach Rd., Panama City, FL 32407]

82-000279 Poddubnyy, A. G. and A. I. Bakanov. QUANTITATIVE ESTIMATION OF BENTHOS CONSUMPTION BY FISHES. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):102-111. 1980. SFA 27(1)
[Inst. Biol. Inland Waters, USSR Acad. Sci., Borok, Yaroslavl Prov., USSR]

FOODS/FEEDING (CONTINUED)

82-000280 Portsev, P. I. THE FEEDING OF THE CUTLASSFISH, *TRICHIURUS LEPTURUS* (TRICHIURIDAE), OFF THE WEST COAST OF INDIA. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):60-65. 1980. SFA 27(1)
[AzCherNIRO, Kerch, USSR]

82-000281 Potts, G. W. BEHAVIOURAL INTERACTIONS BETWEEN THE CARANGIDAE (PISCES) AND THEIR PREY ON THE FORE-REEF SLOPE OF ALDABRA, WITH NOTES ON OTHER PREDATORS. *J. Zool. (Lond.)* 195(3):385-404. Nov. 1981. SFA 27(1)
[Mar. Biol. Assoc. U.K., Citadel Hill, Plymouth, England]

82-000282 Stewart, D. J.; J. F. Kitchell and L. B. Crowder. FORAGE FISHES AND THEIR SALMONID PREDATORS IN LAKE MICHIGAN. *Trans. Am. Fish. Soc.* 110(6):751-763. Nov. 1981. SFA 27(1)
[Fish Div., Dep. Zool., Field Mus. Nat. Hist., Chicago, IL 60605]

82-000283 Uotani, I.; K. Matsuzaki; Y. Makino; K. Noda; O. Inamura and M. Horikawa. [FOOD HABITS OF LARVAE OF TUNAS AND THEIR RELATED SPECIES IN THE AREA NORTHWEST OF AUSTRALIA.] *Bull. Jpn. Soc. Sci. Fish.* 47(9):1165-1172. Sept. 1981. In Japanese with English summ. SFA 27(1)
[Fac. Mar. Sci. Technol., Tokai Univ., Shimizu 424, Japan] Gut contents of a total of 4159 larvae of albacore, yellowfin tuna, bigeye tuna, southern bluefin tuna, skipjack and fregate tuna collected in the area northwest of Australia from Oct. 1977 to Jan. 1978, and from Dec. 1978 to Mar. 1979, were examined. The results obtained are as follows. 1. Gut contents of tunas and those of skipjack and fregate tuna are noticeably different in the composition of food elements: Four species of tunas feed generally on the Copepoda and other zooplanktons in nearly equal numbers of slightly more Copepoda, whereas skipjack and fregate tuna Appendicularia and *Evadne*. 2. Ivlev's electivity index indices suggest that the difference in the food composition between the above two groups of larvae could be attributable to the difference in their feeding habit on prey organisms, not to the plankton composition in their habitats. 3. Individual gut contents of four species of tunas are mainly small ones of 0.21-0.80 mm body length. Gut contents of skipjack and fregate tuna, however, comprize a large quantity of those exceeding 0.81 mm body length.

82-000284 Witzell, W. N. PREDATION ON JUVENILE GREEN SEA TURTLES *CHELONIA MYDAS*, BY A GROUPER, *PROMICROPS LANCEOLATUS* (PISCES; SERRANIDAE) IN THE KINGDOM OF TONGA, SOUTH PACIFIC. *Bull. Mar. Sci.* 31(4):935-936. Oct. 1981. SFA 27(1)
[NMFS, Southeast Fish. Cent., 75 Virginia Beach Dr., Miami, FL 33149]

AGE AND GROWTH

82-000285 Brege, D. A. GROWTH CHARACTERISTICS OF YOUNG-OF-THE-YEAR WALLEYE, *STIZOSTEDION VITREUM VITREUM*, IN JOHN DAY RESERVOIR ON THE COLUMBIA RIVER, 1979. *NOAA Fish. Bull.* 79(3):567-569. July 1981. SFA 27(1)
[NMFS, 2725 Montlake Blvd. East, Seattle, WA 98112]

82-000286 Chubb, C. F.; I. C. Potter; C. J. Grant; R. C. J. Lenanton and J. Wallace. AGE STRUCTURE, GROWTH RATES AND MOVEMENTS OF SEA MULLET, *MUGIL CEPHALUS* L., AND YELLOW-EYE MULLET, *ALDRICHETTA FORSTERI*

AGE AND GROWTH (CONTINUED)

82-000285 CONTINUED
[Inst. Vert. Zool., Czech. Acad. Sci., Brno, Czechoslovakia] Using a sample of 811 individuals of bream, *Abramis brama* (Linnaeus, 1758), from the Mostiště reservoir the author analysed the growth, age and mortality. The length class 180 mm (standard length), weight class 40 to 60g and the age groups V to IX were the most numerous. Three formulae for the conversion of the standard length to the total length and *vice versa* are given for three different length classes of fish. The formula for the length class 191 to 240mm (standard length) is as follows: 1=0.77XL; L=1.30X1. In the oral sector of the scales there were 2 to 6 radii, mostly 3; in the caudal sector 10 to 31 radii, mostly 14. The year mark in one to three year old bream was formed in the spring; that in older fish, in the autumn. The intercept estimated by fitting the body scale relationship by eye was 20mm; that computed using the linear functional regression, 23.6mm. The growth rate of the bream was very slow. The values of the coefficient of condition varied between 1.61 and 2.83. The mortality of males was 50%, that of females was by 7 to 8% lower.

82-000286 Goldspink, C. R. A NOTE ON THE GROWTH-RATE AND YEAR-CLASS STRENGTH OF BREAM, *ABRAMIS BRAMA* (L.), IN THREE EUTROPHIC LAKES, ENGLAND. *J. Fish Biol.* 19(6):665-673. Dec. 1981. SFA 27(1)
[Dep. Biol. Sci., Manchester Polytech., Manchester M15 GD, England] In this study some comparative observations on the growth-rate and year-class strength of bream, *Abramis brama*, in three Shropshire-Cheshire meres are given. All populations are exposed to variable recruitment. The occurrence of four strong year-classes (1959, 1966, 1969, 1973) suggests that climate is an important factor influencing spawning success. Water temperatures ≧16°C in July and August may be particulary important. All other intervening year-classes are absent. The growth-rate of bream in Tatton Mere and Ellesmere Mere is good ($L\infty$=541-561 mm) but comparatively poor ($L\infty$=448 mm) in Cole Mere. The significance of population density, food supply and parasitic infestation by *Ligula intestinalis* is discussed.

82-000287 Kochkin, P. N. HOW TO PREPARE FISH VERTEBRAE FOR AGE DETERMINATION. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):153-157. 1980. SFA 27(1)
[VNIRO, Moscow, USSR]

82-000288 Layher, W. G. COMPARISON OF ANNULUS COUNTS OF PECTORAL AND DORSAL SPINES IN FLATHEAD CATFISH. *Prog. Fish.-Cult.* 43(4):218-219. Oct. 1981. SFA 27(1)
[Okla. Coop. Fish. Res. Unit, Life Sci. West 433, Okla. State Univ., Stillwater 74074]

82-000289 Marí, A. and R. Dominguez. DISTRIBUCIÓN, EDAD Y CRECIMIENTO DE LA MERLUZA PLATEADA (*MERLUCCIUS BILINEARIS*) EN LA PLATAFORMA DE NUEVA ESCOCIA. [DISTRIBUTION, AGE AND GROWTH OF SILVER HAKE (*MERLUCCIUS BILINEARIS*) IN THE NOVA SCOTIAN SHELF.] *Riv. Cubana Invest. Pesq.* 4(2):78-106. 1979. SFA 27(1)
[Cent. Invest. Pesq., Ave. 1ra. y 26, Miramar, Ciudad Habana, Cuba]

82-000290 Mallicoate, D. L. and R. H. Parrish. SEASONAL GROWTH PATTERNS OF CALIFORNIA STOCKS OF NORTHERN ANCHOVY, *ENGRAULIS MORDAX*, PACIFIC MACKEREL, *SCOMBER JAPONICUS*, AND JACK MACKEREL, *TRACHURUS SYMMETRICUS*. *Calif. Coop. Oceanic Fish. Invest. Rep.* 22:69-81. Oct. 1981. SFA 27(1)
[NMFS, Southwest Fish Cent., Monterey, CA 93940]

AGE AND GROWTH (CONTINUED)

82-000292 CONTINUED
[Okla. Coop. Fish. Res. Unit, Life Sci. West 433, Okla. State Univ., Stillwater 74074]

82-000293 Marí, A. and R. Dominguez. DISTRIBUCIÓN, EDAD Y CRECIMIENTO DE LA MERLUZA PLATEADA (*MERLUCCIUS BILINEARIS*) EN LA PLATAFORMA DE NUEVA ESCOCIA. [DISTRIBUTION, AGE AND GROWTH OF SILVER HAKE (*MERLUCCIUS BILINEARIS*) IN THE NOVA SCOTIAN SHELF.] *Riv. Cubana Invest. Pesq.* 4(2):78-106. 1979. SFA 27(1)
[Cent. Invest. Pesq., Ave. 1ra. y 26, Miramar, Ciudad Habana, Cuba]

82-000294 Mallicoate, D. L. and R. H. Parrish. SEASONAL GROWTH PATTERNS OF CALIFORNIA STOCKS OF NORTHERN ANCHOVY, *ENGRAULIS MORDAX*, PACIFIC MACKEREL, *SCOMBER JAPONICUS*, AND JACK MACKEREL, *TRACHURUS SYMMETRICUS*. *Calif. Coop. Oceanic Fish. Invest. Rep.* 22:69-81. Oct. 1981. SFA 27(1)
[NMFS, Southwest Fish Cent., Monterey, CA 93940]

82-000295 Persat, H. and E. Pattee. THE GROWTH RATE OF YOUNG GRAYLING IN SOME FRENCH RIVERS. *Int. Ver. Theor. Angew. Limnol. Verh.* 21(Part 2):1270-1275. 1981. In English with French summ. SFA 27(1)
[Dep. Biol. Anim., Univ. Claude-Bernard-Lyon-I, 43 bd du 11 novembre, F-69622 Villeurbonne Cedex, France]

82-000296 Pozo, E. EDAD Y CRECIMIENTO DEL PARGO CRIOLLO (*LUTJANUS ANALIS* CUVIER, 1828) EN LA PLATAFORMA NORORIENTAL DE CUBA. [AGE AND GROWTH OF MUTTON SNAPPER (*LUTJANUS ANALIS* CUVIER, 1828) IN THE NORTHEASTERN CUBAN SHELF.] *Riv. Cubana Invest. Pesq.* 4(2):1-24. 1979. In Spanish with English summ. SFA 27(1)
[Cent. Invest. Pesq., Ave. 1ra. y 26, Miramar, Ciudad Habana, Cuba]

82-000297 Prokes, M. SEASONAL GROWTH OF CHUB, LEUCISCUS CEPHALUS, IN THE ROKYTNÁ STREAM. *Folia Zool.* 30(4):371-384. 1981. In English with Russian summ. SFA 27(1)
[Inst. Vert. Zool., Czech. Acad. Sci., Brno, Czechoslovakia] Data are given on the seasonal growth of chub, *Leuciscus cephalus* (Linnaeus, 1758), in the first two years of life. The study was implemented in a section of the Rokytná stream in 1974 through 1976. In total, 3,012 individuals were examined. A high growth intensity was ascertained during the period from May to September. In this period of time the monthly increments in length varied between 0.8 and 7.2mm. The increments in October and April were low (0.8 to 3.1mm), in the winter months negligible to zero (0.0 to 0.8mm). At the end of the 1st year of life the average standard lengths varied in different years of study between 8.6 and 8.9mm and at the end of the 2nd year of life between 32.2 and 34.0mm. The growth in weight and the length-weight relationship were also analysed. Growth data obtained by direct fish measurements were generally lower than the back-calculated growth data resulting from scale reading available in the literature.

82-000298 Protopopov, N. K. THE FORMATION OF SPAWNING RINGS AND SUPPLEMENTARY RINGS ON THE SCALES OF THE PECHORA RIVER WHITEFISH, *COREGONUS LARVARETUS PIDSCHIAN*. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):38-45. 1980. SFA 27(1)
[North. Dep., PINRO, Arkhangelsk, USSR]

AGE AND GROWTH (CONTINUED)

82-000299 Tanaka, K.; Y. Mugiya and J. Yamada. EFFECTS OF PHOTOPERIOD AND FEEDING ON DAILY GROWTH PATTERNS IN OTOLITHS OF JUVENILE *TILAPIA NILOTICA*. *NOAA Fish. Bull.* 7(3):459-466. July 1981. SFA 27(1)
[Lab. Physiol. Ecol., Fac. Fish., Hokkaido Univ., Hakodate, Hokkaido 041, Japan] Effects of varying photoperiods and feeding times on the formation of daily rings in otoliths of juvenile *Tilapia nilotica* were studied with a scanning electron microscope. Two alternate concentric zones, each different in structure, were distinguished in the acid-etched ground plane: one thin and appearing as a groove (discontinuous zone) and the other thick and with well-developed, needlelike crystals (incremental zone). The number of incremental zones showed a good correlation with the chronological age in days after hatching for at least 28 days. The otolith showed a daily rhythm of growth under a photoperiod of 24 hours (12 light-12 dark). Growth of incremental zones started a few hours after lights-on and stopped or slowed down within a few hours of the following lights-on, during which time the discontinuous zone seemed to be formed. When the light and dark cycle was reversed, the cycle of otolith growth began to change on the second day and accommodated to the new photocondition 6 days after the reversal. A change in length of light and dark phases (18L-6D or 6L-18D) or a shift of feeding time did not affect the time of the discontinuous and incremental zone formation.

82-000300 Wańkowski, J. W. J. ESTIMATED GROWTH OF SURFACE-SCHOOLING SKIPJACK TUNA, *KATSUWONUS PELAMIS*, AND YELLOWFIN TUNA, *THUNNUS ALBACARES*, FROM THE PAPUA NEW GUINEA REGION. *NOAA Fish. Bull.* 79(3):517-532. July 1981. SFA 27(1)
[Minist. Conserv., Mar. Sci. Lab., P.O. Box 114, Queenscliff, Victoria 3225, Australia]

GEOGRAPHICAL DISTRIBUTION, FISH SURVEYS, ETC.

82-000301 Branstetter, S. BIOLOGICAL NOTES ON THE SHARKS OF THE NORTH CENTRAL GULF OF MEXICO. *Contrib. Mar. Sci.* 24:13-34. Sept. 1981. SFA 27(1)
[Dep. Wildl. Fish. Sci., Tex. A&M Univ., College Station 77843]

82-000302 Clark, M. R. PROBABLE ESTABLISHMENT AND RANGE EXTENSION OF THE SPOTTED TILAPIA, *TILAPIA MARIAE* BOULENGER (PISCES: CICHLIDAE) IN EAST CENTRAL FLORIDA. *Fla. Sci.* 44(3):168-171. 1981. SFA 27(1)
[Harbor Branch Found., Inc., RR 1, Box 196, Fort Pierce, FL 33450]

82-000303 Cohen, D. M. NEW AND RARE OPHIDIIFORM FISHES FROM THE EASTERN ATLANTIC: CANARY ISLANDS TO THE CAPE OF GOOD HOPE. *Proc. Biol. Soc. Wash.* 94(4):1085-1103. 31 Dec. 1981. SFA 27(1)
[Syst. Lab., NMFS, Natl. Mus. Natl. Hist., Washington, DC 20560]

82-000304 DeWitt, H. H.; P. A. Grecay; J. S. Hacunda; B. P. Lindsay; R. F. Shaw and D. W. Townsend. AN ADDITION TO THE FISH FAUNA OF THE GULF OF MAINE WITH RECORDS OF RARE SPECIES. *Proc. Biol. Soc. Wash.* 94(3):669-674. Oct. 1981. SFA 27(1)
[Dep. Oceanogr., Univ. Me., Ira C. Darling Cent., Walpole 04573]

82-000305 Gjøsæter, J. and I.-M. Beck. MESOPELAGIC FISH OFF MOZAMBIQUE. *Fiskeridir. Skr. Ser. Havunders.* 17(6):253-265. 1981. SFA 27(1)
[Dep. Fish. Biol., Univ. Bergen, Norway]

GEOGRAPHICAL DISTRIBUTION, FISH SURVEYS, ETC. (CONTINUED)

82-000306 Gunkel, G. KÖRPERZUSAMMENSETZUNG, WACHSTUM UND NAHRUNGSNUTZUNG VON JUNGEN SANDFELCHEN (*CORGONUS FERA* JURINE) BEI FÜTTERUNG MIT TEICHPLANKTON UND IM HUNGER. [BODY COMPOSITION, GROWTH, AND GROSS GROWTH EFFICIENCY OF YOUNG *COREGONUS FERA* JURINE FED WITH POND ZOOPLANKTON AND UNDER STARVATION CONDITIONS.] *Arch. Hydrobiol.* 92(4):419-456. 1981. In German with English summ. SFA 27(1)
[Tech. Univ. Berlin, Inst. Tech. Umweltsch., Sekr. KF3, Strasse des 17. Juni 135, 1000 Berlin 12, West Germany]

82-000307 Hardy, G. S. NEW RECORDS OF PUFFERFISHES (FAMILY TETRAODONTIDAE) FROM AUSTRALIA AND NEW ZEALAND, WITH NOTES ON *SPHOEROIDES PACHYGASTER* (MÜLLER AND TROSCHEL) AND *LAGOCEPHALUS SCELERATUS* (GMELIN). *Natl. Mus. N.Z. Rec.* 1(20):311-316. 31 Mar. 1981. SFA 27(1)
[Natl. Mus. N.Z., Wellington, New Zealand]

82-000308 Harvey, H. H. FISH COMMUNITIES OF THE LAKES OF THE BRUCE PENINSULA. *Int. Ver. Theor. Angew. Limnol. Verh.* 21(Part 2):1222-1230. 1981. SFA 27(1)
[Zool. Dep., Univ. Toronto, Toronto, ON M5S 1A1, Canada]

82-000309 Hill, L. G.; W. J. Matthews; T. Schene and K. Asbury. NOTES ON FISHES OF GRAND RIVER, CHOUTEAU CREEK, AND PRYOR CREEK, MAYES COUNTY, OKLAHOMA. *Proc. Okla. Acad. Sci.* 61:76-77. 1981. SFA 27(1)
[Dep. Zool., Univ. Okla., Norman 73019]

82-000310 Hoffman, W.; T. H. Fritts and R. P. Reynolds. WHALE SHARKS ASSOCIATED WITH FISH SCHOOLS OFF SOUTH TEXAS. *Northeast Gulf Sci.* 5(1):55-57. Oct. 1981. SFA 27(1)
[Dep. Biol., Univ. South Fla., Tampa 33620]

82-000311 Karaman, I. I. ON THE QUANTITATIVE DISTRIBUTION OF FLYINGFISH OF THE FAMILY EXOCOETIDAE IN THE INDIAN OCEAN. *J. Ichthyol. (Engl. Trans. Vopr. Ikhtiol.)* 20(5):155-157. 1980. SFA 27(1)
[Exp. Construction Bur. Underwater Invest., Sevastopol, USSR]

82-000312 Lanigan, S. H. and C. R. Berry, Jr. DISTRIBUTION OF FISHES IN THE WHITE RIVER, UTAH. *Southwest. Nat.* 26(4):389-393. 20 Nov. 1981. SFA 27(1)
[Utah Coop. Fish. Res. Unit, Utah State Univ., Logan 84322]

82-000313 Macdonald, J. S. and K. Brewer. RANGE EXTENSION OF THE WHITEBAIT SMELT (*ALLOSMERUS ELONGATUS*) IN BRITISH COLUMBIA. *Syesis* 13:209. 1980. SFA 27(1)
[Dep. Zool., Univ. West Ontario, London, ON N6A 5B7, Canada]

82-000314 Magnin, E. BIOÉCOLOGIE DES POISSONS DU TERRITOIRE DE LA BAIE JAMES, QUÉBEC, CANADA. [BIOECOLOGY OF FISH IN THE TERRITORY OF JAMES BAY, QUEBEC, CANADA] *Int. Ver. Theor. Angew. Limnol. Verh.* 21(Part 2):1244-1250. 1981. In French. SFA 27(1)
[Dep. Biol., Univ. Montreal, C.P. 6128, Montreal, PQ, Canada]

82-000315 Matheson, R. E., Jr. THE DISTRIBUTION OF THE FLAGFIN MOJARRA, *EUCINOSTOMUS MELANOPTERUS* (PISCES: GERREIDAE) WITH ECOLOGICAL NOTES ON TEXAS AND FLORIDA POPULATIONS. *Northeast Gulf Sci.* 5(1):63-66. Oct. 1981.

GEOGRAPHICAL DISTRIBUTION, FISH SURVEYS, ETC. (CONTINUED)

82-000315 CONTINUED SFA 27(1)
[Dep. Wildl. Fish. Sci., Tex. A&M Univ., College Station 77843]

82-000316 Maxwell, J. G. H. and G. R. Cresswell. DISPERSAL OF TROPICAL MARINE FAUNA TO THE GREAT AUSTRALIAN BIGHT BY THE LEEUWIN CURRENT. *Aust. J. Mar. Freshwater Res.* 32(4):493-500. 1981. SFA 27(1)
[Div. Fish. Res., CSIRO, P.O. Box 21, Cronulla, N.S.W. 2230, Australia]

82-000317 Murdy, E. O.; C. J. Ferraris, Jr.; D. F. Hoese and R. C. Steene. PRELIMINARY LIST OF FISHES FROM SOMBRERO ISLAND, PHILIPPINES, WITH FIFTEEN NEW RECORDS. *Proc. Biol. Soc. Wash.* 94(4):1163-1173. 31 Dec. 1981. SFA 27(1)
[Dep. Wildl. Fish. Sci., Tex. A&M Univ., College Station 77843]

82-000318 Nagtegaal, D. A. and S. P. Farlinger. FIRST RECORD OF TWO FISHES, *SERIOLA DORSALIS* (GILL) AND *MEDIALUNA CALIFORNIENSIS* (STEINDACHNER) FROM WATERS OFF BRITISH COLUMBIA. *Syesis* 13:207-208. 1980. SFA 27(1)
[Dep. Fish. Oceans, Pac. Biol. Stn., Nanaimo, BC V9R 5K6, Canada]

82-000319 Nelva, A.; E. Pattee; J. F. Perrin; H. Persat and A. L. Roux. STRUCTURE ET FONCTIONNEMENT DES ECOSYSTÈMES DU HAUT-RHÔNE FRANÇAIS. 25 PREMIÈRES OBSERVATIONS SUR LES POPULATIONS PICICOLES DANS LE SECTEUR DE BRÉGNIER-CORDON. [STRUCTURE AND DYNAMICS OF THE FRENCH UPPER RHÔNE ECOSYSTEMS. 25. SOME PRELIMINARY OBSERVATIONS ON THE FISH POPULATIONS IN THE BRÉGNIER-CORDON DISTRICT.] *Int. Ver. Theor. Angew. Limnol. Verh.* 21(Part 2):1276-1282. 1981. In French with English summ. SFA 27(1)
[Dep. Biol. Anim., E.R.A., C.N.R.S. 849, Univ. C. Bernard-Lyon I, 43 Bd du 11. 11. 1818, F-69622 Villeurbanne Cedex, France]

82-000320 Olsen, H. F.; R. M. Dowling and D. Bateman. BIOLOGICAL RESOURCES SURVEY (ESTUARINE INVENTORY) ROUND HILL TO TANNUM SANDS, QUEENSLAND, AUSTRALIA. *Queensl. Fish. Serv. Res. Bull.* No. 2. 102p. 1980. SFA 27(1)
[P.O. Box 344, Fortitude Valley 4006, Queensland, Australia]

82-000321 Peden, A. E. and D. Nagtegaal. OCCURRENCE OF THE PILOTFISH (*NAUCRATES DUCTOR*, CARANGIDAE) OFF BRITISH COLUMBIA. *Syesis* 13:213. 1980. SFA 27(1)
[British Columbia Prov. Mus., Victoria, BC V8V 1X4, Canada]

82-000322 Peden, A. E. and W. Ostermann. THREE FISH SPECIES PREVIOUSLY UNKNOWN FROM MARINE WATERS OFF BRITISH COLUMBIA. *Syesis* 13:215-217. 1980. SFA 27(1)
[British Columbia Prov. Mus., Victoria, BC V8V 1X4, Canada]

82-000323 Pequeño R., G. THE RARE FISH *NEOPHRYNICHTHYS MARMORATUS* REGAN 1913, IN THE SOUTHERN SLOPE OF CHILE (TELEOSTOMI, PSYCHROLUTIDAE). *J. Nat. Hist.* 15(6):965-970. Nov.-Dec. 1981. SFA 27(1)
[Inst. Zool., Univ. Austral Chile, Casilla 567, Valdivia, Chile]

GEOGRAPHICAL DISTRIBUTION, FISH SURVEYS, ETC. (CONTINUED)

82-000324 Reichenbach-Klinke, H.-H. 25 JAHRE ICHTHYOLOGISCHE FORSCHUNG AN DER BAYERISCHEN DONAU UND IHREN NEBENFLÜSSEN. [25 YEARS OF ICHTHYOLOGICAL INVESTIGATIONS AT THE BAVARIAN DANUBE AND HER CONTRIBUTARIES.] *Arch. Hydrobiol. Supplementb.* 52(4):339-349. 1981. In German with English summ. SFA 27(1)
[Inst. Zool. Hydrobiol., Univ. München, Kaulbockstr. 27, D-8000 München 22, West Germany]

82-000325 Ryan, P. A. RECORDS OF THREE NEW FRESHWATER FISHES FROM THE FIJI ISLANDS. *Pac. Sci.* 35(1):93-95. Jan. 1981. SFA 27(1)
[Univ. South Pac., Sch. Nat. Resour., P.O. Box 1168, Suva, Fiji]

82-000326 Sasaki, S.; S. Yamamoto and K. Shimazaki. [ECOLOGICAL STUDIES ON THE POMFRET (*BRAMA JAPONICA* HILGENDORF) II. A NORTH-SOUTH DISTRIBUTION OF THE POMFRET ALONG LONGITUDE 175°30'E IN LATE JULY.] *Bull. Fac. Fish. Hokkaido Univ.* 32(3):225-233. Sept. 1981. In Japanese with English summ. SFA 27(1)
[Fac. Fish., Hokkaido Univ., Hakodate 041, Japan]

ABUNDANCE, FACTORS OF; SURVIVAL AND MORTALITY

82-000327 Collins, J. P.; C. Young; J. Howell and W. L. Minckley. IMPACT OF FLOODING IN A SONORAN DESERT STREAM, INCLUDING ELIMINATION OF AN ENDANGERED FISH POPULATION (*POECILIOPSIS O. OCCIDENTALIS*, POECILIIDAE). *Southwest. Nat.* 26(4):415-423. 20 Nov. 1981. SFA 27(1)
[Dep. Zool., Ariz. State Univ., Tempe 85287] Tule Creek is an intermittent stream draining Sonoran desertscrub in Yavapai Co., Arizona. An 800-m segment has perennial surface discharge and was the site of a ciénaga community dominated by *Scirpus olneyi* and *Anemopsis californica*. Extensive flooding in winter 1978 had the following immediate impacts on the system: 1) an introduced population of the endangered Sonoran topminnow (*Poeciliopsis o. occidentalis*) was destroyed, 2) substrate erosion and entrainment removed vegetation, reduced number of pools, straightened and deepened the channel; and 3) canyon treefrog (*Hyla arenicolor*) and saltcedar (*Tamarix chinensis*) were introduced.

82-000328 Elliott, S. T. and R. Bartoo. RELATION OF LARVAL *POLYPEDILUM (DIPTERA: CHIRONOMIDAE) TO PINK SALMON EGGS AND ALEVINS IN AN ALASKAN STREAM. Prog. Fish.-Cult.* 43(4):220-221. Oct. 1981. SFA 27(1)
[Alaska Dep. Fish Game, 210 Ferry Way, Juneau 99801]

82-000329 Frank, K. T. and W. C. Leggett. PREDICTION OF EGG DEVELOPMENT AND MORTALITY RATES IN CAPELIN (*MALLOTUS VILLOSUS*) FROM METEOROLOGICAL, HYDROGRAPHIC, AND BIOLOGICAL FACTORS. *Can. J. Fish. Aquatic Sci.* 38(11):1327-1338. Nov. 1981. SFA 27(1)
[Dep. Biol., McGill Univ., Montreal, PQ H3A 1B1, Canada]

82-000330 Holt, J.; R. Godbout and C. R. Arnold. EFFECTS OF TEMPERATURE AND SALINITY ON EGG HATCHING AND LARVAL SURVIVAL OF RED DRUM, *SCIAENOPS OCELLATA. NOAA Fish. Bull.* 79(3):569-573. July 1981. SFA 27(1)
[Univ. Tex. Mar. Sci. Inst., Port Aransas Mar. Lab., Port Aransas, TX 78373]

ABUNDANCE, FACTORS OF; SURVIVAL AND MORTALITY (CONTINUED)

82-000331 Kuznetsov, V. A. FLUCTUATION IN THE ABUNDANCE OF COMMERCIAL FISHES INFLUENCED BY REGULATED RIVER DISCHARGE (AS EXEMPLIFIED BY KUYBYSHEV RESERVOIR). *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):32-38. 1980. SFA 27(1)
[Dep. Vert. Zool., Kazan Univ., USSR]

IDENTIFICATION, KEYS, CLASSIFICATION

82-000332 Anderson, W. D., Jr. A NEW SPECIES OF INDO-WEST PACIFIC *ETELIS* (PISCES: LUTJANIDAE), WITH COMMENTS ON OTHER SPECIES OF THE GENUS. *Copeia* 1981(4):820-825. 29 Dec. 1981. SFA 27(1)
[Grice Mar. Biol. Lab., Coll. Charleston, 205 Fort Johnson, Charleston, SC 29412]

82-000333 Bath, H. and P. Wirtz. REDISCOVERY OF *HYPLEUROCHILUS AEQUIPINNIS* (GÜNTHER 1861) IN WEST AFRICA (PISCES: BLENNIIDAE). *Senckenbergiana Biol.* 61(5-6):349-355. 1981. In English with German summ. SFA 27(1)
[Luisenstr. 45, D-6780 Pirmasens, East Germany]

82-000334 Bath, H. DER HOLOTYPUS VON *BLENNIUS PONTICUS* SLASTENENKO 1934 UND SEINE TAXONOMISCHE STELLUNG (PISCES: BLENNIIDAE). [THE HOLOTYPE OF *BLENNIUS PONTICUS* SLASTENENKO 1934 AND REDISCRIPTION (PISCES: BLENNIIDAE).] *Senckenbergiana Biol.* 61(5-6):337-348. 1981. In German with English summ. SFA 27(1)
[Luisenstr. 45, D-6780 Pirmasens, East Germany]

82-000335 Bekker, V. E. and O. D. Borodulina. COMPOSITION AND DISTRIBUTION OF THE SPECIES GROUP *LAMPANYCUTUS MACROPTERUS* (MYCTOPHIDAE). *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):20-32. 1980. SFA 27(1)
[Inst. Oceanol., IOAN, Moscow, USSR]

82-000336 Brown, J. A. and P. W. Colgan. THE USE OF LATERAL-BODY BAR MARKINGS IN IDENTIFICATION OF YOUNG-OF-YEAR SUNFISH (*LEPOMIS*) IN LAKE OPINICON, ONTARIO. *Can. J. Zool.* 59(9):1852-1855. Sept. 1981. In English with French summ. SFA 27(1)
[Dep. Biol., Queen's Univ., Kingston, ON K7L 3N6, Canada] Lateral-body bar marking differences can be used for identifying young-of-year bluegills and pumpkinseeds. The young-of-year of both species were reared in the laboratory from eggs and examined weekly for lateral-body bar pigmentation development. Pumpkinseeds were found to develop spots between the bars when they had reached the size of 25 mm while bluegills never developed spots but had distinct body bars by 24 mm. Examination of older fish of both species from three natural populations confirmed these differences as species typical.

82-000337 Chereshnev, I. A. and A. V. Balushkin. A NEW SPECIES OF BLACKFISH, *DALLIA ASMIRABILIS* SP. N. (UMBRIDAE, ESOCIFORMES) FROM THE AMGUEMA RIVER BASIN (ARCTIC CHUKOTKA). *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):25-30. 1980. SFA 27(1)
[Biol. Soil Inst., Far East. Sci. Cent., USSR Acad. Sci., Vladivostok, USSR]

IDENTIFICATION, KEYS, CLASSIFICATION (CONTINUED)

82-000338 Chernoff, B. TAXONOMY OF THE MEXICAN ATHERINID FISH GENUS *ARCHOMENIDIA*. *Copeia* 1981(4):913-914. 29 Dec. 1981. SFA 27(4)
[Fish Div., Mus. Zool., Sch. Nat. Resour., Univ. Mich., Ann Arbor 48109]

82-000339 Coad, B. W. *PSEUDOPHOXINUS PERSIDIS*, A NEW CYPRINID FISH FROM FARS, SOUTHERN IRAN. *Can. J. Zool.* 59(11):2058-2063. Nov. 1981. In English with French summ. SFA 27(1)
[Ichthyol. Sect., Natl. Mus. Nat. Sci., Ottawa, ON K1A 0M8, Canada]

82-000340 Dooley, J. K. A NEW SPECIES OF TILEFISH (PISCES: BRANCHIOSTEGIDAE) FROM BERMUDA, WITH A BRIEF DISCUSSION OF THE GENUS *CAULOLATILUS*. *Northeast Gulf Sci.* 5(1):39-44. Oct. 1981. SFA 27(1)
[Dep. Biol., Adelphi Univ., Garden City, NY 11530]

82-000341 Dorofeyeva, Ye. A.; Ye. A. Zinov'yev; V. A. Klyukanov, Yu. S. Reshetnikov; K. A. Savvaitova and G. Kh. Shaposhnikova. THE PRESENT STATE OF RESEARCH INTO THE PHYLOGENY AND CLASSIFICATION OF SALMONOIDEI. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):1-20. 1980. SFA 27(1)
[Inst. Zool., USSR Acad. Sci., Leningrad, USSR]

82-000342 Elovenko, V. N. [TAXONOMIC STATUS AND GEOGRAPHICAL DISTRIBUTION OF THE FISHES (GOBIOIDEI, PERCIFORMES, ELEOTRIDAE) INTRODUCED IN WATER BODIES OF THE EUROPEAN PART OF THE USSR, KAZAKHSTAN AND MIDDLE ASIA.] *Zool. Zh.* 60(10):1517-1522. Oct. 1981. In Russian with English summ. SFA 27(1)
[All-Union Res. Inst. Pond Fish., Rybnoye Region, USSR]

82-000343 Fritzsche, R. A. A NEW SPECIES OF PIPEFISH (PISCES: SYNGNATHIDAE: *MICROGNATHUS*) FROM TAHITI. *Proc. Biol. Soc. Wash.* 94(3):771-773. Oct. 1981. SFA 27(1)
[Dep. Fish., Humboldt State Univ., Arcata, CA 95521]

82-000344 Howes, G. ANATOMY AND PHYLOGENY OF THE CHINESE MAJOR CARPS *CTENOPHARYNGODON* STEIND., 1866 AND *HYPOPHTHALMICHTHYS* BLKR., 1860. *Bull. Br. Mus. (Nat. Hist.) Zool. Ser.* 41(1):1-52. 27 Aug. 1981. SFA 27(1)
[Dep. Zool., Br. Mus. (Nat. Hist.), Cromwell Rd., London SW7 5BD, England]

82-000345 Humphries, J. M., Jr. THE EVOLUTION OF A SPECIES FLOCK IN THE GENUS *CYPRINODON* (PISCES: CYPRINODONTIDAE). *Ph.D. dissertation, Univ. Mich.* 246p. 1981. From Diss. Abstr. Int. B Sci. Eng. 42(6):2261. Dec. 1981. SFA 27(1)

82-000346 Lobel, P. S. *BODIANUS PROGNATHUS* (LABRIDAE, PISCES), A NEW LONGNOSE HOGFISH FROM THE CENTRAL PACIFIC. *Pac. Sci.* 35(1):45-50. Jan. 1981. SFA 27(1)
[Harvard Univ., Cent. Earth Planetary Phys., Cambridge, MA 02138]

82-000347 Meyer, M. K. and D. Vogel. EIN NEUER *POECILIOPSIS* AUS CHIAPAS, MEXICO (PISCES: POECILIIDAE). [A NEW *POECILIOPSIS* FROM CHIAPAS, MEXICO (PISCES: POECILIIDAE).] *Senckenbergiana Biol.* 61(5-6):357-361. 1981. In German with English summ. SFA 27(1)
[Schwalheimer Haupstr. 22, D-6350 Bod Naukheim 6, West Germany]

IDENTIFICATION, KEYS, CLASSIFICATION (CONTINUED)

82-000348 Miller, P. J. THE SYSTEMATIC POSITION OF A WEST AFRICAN GOBIOID FISH, *ELEOTRIS MALTZANI* STEINDACHNER. *Zool. J. Linn. Soc.* 73(3):273-286. Nov. 1981. SFA 27(1)
[Zool. Dep., The University, Bristol BS8 1UG, England]

82-000349 Mirza, M. R.; T. T. Nalbant and P. M. Banarescu. A REVIEW OF THE GENUS *SCHISTURA* IN PAKISTAN WITH DESCRIPTION OF NEW SPECIES AND SUBSPECIES (PISCES, COBITIDAE, NOEMACHELINAE). *Bijdr. Dierkd.* 5(1):105-130. 1981. SFA 27(1)
[Government Coll., Dep. Zool., Lahore, Pakistan]

82-000350 Mukhacheva, V. A. A REVIEW OF THE GENUS *ICHTHYOCOCCUS* BONAPARTE (PHOTOCHTHYIDAE). *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):1-14. 1980. SFA 27(1)
[Inst. Oceanol., USSR Acad. Sci., Moscow, USSR]

82-000351 Pietsch, T. W. THE OSTEOLOGY AND RELATIONSHIPS OF THE ANGLERFISH GENUS *TETRABRACHIUM* WITH COMMENTS ON LOPHIIFORM CLASSIFICATION. *NOAA Fish. Bull.* 79(3):387-419. July 1981. SFA 27(1)
[Coll. Fish., Univ. Wash., Seattle, 98195]

82-000352 Pinchuk, V. I. [ON THE PHENETIC AND PHYLETIC RELATIONS OF THE SMALL-MOUTHED FAR EAST GOBIES OF THE GENERA *CHAENOGOBIUS* AND *RHODONIICHTHYS* (PERCIFORMES, GOBIIDAE).] *Zool. Zh.* 60(10):1508-1516. Oct. 1981. In Russian with English summ. SFA 27(1)
[Kherson Hydrobiol. Stn., Inst. Hydrobiol., Acad. Sci. Ukrainian SSR, USSR]

82-000353 Randall, J. E. and H. A. Randall. A REVISION OF THE LABRID FISH GENUS *PSEUDOJULOIDES*, WITH DESCRIPTIONS OF FIVE NEW SPECIES. *Pac. Sci.* 35(1):51-74. Jan. 1981. SFA 27(1)
[Bernice P. Bishop Mus., P.O. Box 19000-A, Honolulu, HI 96819]

82-000354 Reid, G. M. THE IDENTITY AND PROVENANCE OF *LABEO WERNERI* LOHBERGER, A SUPPOSEDLY AFRICAN SPECIES OF CYPRINID FISH. *Copeia* 1981(4):915. 29 Dec. 1981. SFA 27(1)
[33 Church St., Storrington, Sussex RH 20 4ED, England]

82-000355 Richardson, S. L. and J. D. McEachran. IDENTIFICATION OF SMALL (<3mm) LARVAE OF KING AND SPANISH MACKEREL, *SCOMBEROMORUS CAVALLA* AND *S. MACULATUS*. *Northeast Gulf Sci.* 5(1):75-79. Oct. 1981. SFA 27(1)
[Gulf Coast Res. Lab., East Beach Dr., Ocean Springs, MS 39564]

82-000356 Sazonov, Yu. I. REPLACEMENT OF THE FAMILY NAME SEARSIIDAE PARR, 1951 BY THE SENIOR SUBJECTIVE SYNONYM PLATYTROCTIDAE ROULE, 1919. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):142-143. 1980. SFA 27(1)
[IOAN, Moscow, USSR]

82-000357 Shaboneyev, I. Ye. SYSTEMATICS, MORPHO-ECOLOGICAL CHARACTERISTICS AND ORIGIN OF CARANGIDS OF THE GENUS *TRACHURUS*. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):15-25. 1980. SFA 27(1)
[VNIRO, Moscow, USSR]

82-000358 Springer, V. G. NOTES ON BLENNIID FISHES OF THE TRIBE OMOBRANCHINI, WITH DESCRIPTIONS OF TWO NEW SPECIES. *Proc. Biol. Soc. Wash.* 94(3):699-707. Oct. 1981. SFA 27(1)
[Div. Fishes, Dep. Vert. Zool., Smithsonian Inst., Washington, DC 20560]

IDENTIFICATION, KEYS, CLASSIFICATION (CONTINUED)

82-000359 Stoneking, M.; D. J. Wagner and A. C. Hildebrand. GENETIC EVIDENCE SUGGESTING SUBSPECIFIC DIFFERENCES BETWEEN NORTHERN AND SOUTHERN POPULATIONS OF BROOK TROUT (*SALVELINUS FONTINALIS*). *Copeia* 1981(4):810-819. 29 Dec. 1981. SFA 27(1)
[Dep. Genet., Univ. Calif., Berkeley 94720]

82-000360 Vari, R. P. and J. Géry. *NANNOCHARAX MACULICAUDA*, A NEW SPECIES OF AFRICAN CHARACOID FISH (CHARACOIDEA: DISTICHODONTIDAE) WITH COMMENTS ON THE GENUS *HEMIGRAMMOCHARAX*. *Proc. Biol. Soc. Wash.* 94(4):1076-1084. 31 Dec. 1981. SFA 27(1)
[Dep. Vert. Zool., Natl. Mus. Nat. Hist., Washington, DC 20560]

82-000361 Vierke, J. *PAROSPHROMENUS FILAMENTOSUS* N. SP. AUS SO-BORNEO (PISCES: BELONTIIDAE). [*PAROSPHROMENUS FILAMENTOSUS* N.SP. FROM SOUTH BORNEO (PISCES: BELONTIIDAE).] *Senckenbergiana Biol.* 61(5-6):363-367. 1981. In German with English summ. SFA 27(1)
[Heinrich-Heine-Str. 15, D-2250 Husum, West Germany]

PARASITES AND DISEASES-GENERAL

82-000362 Conroy, D. A.; J. Morales; C. Perdomo; R. A. Ruiz and J. A. Santacana. PRELIMINARY OBSERVATIONS ON ORNAMENTAL FISH DISEASES IN NORTHERN SOUTH AMERICA. *Riv. It. Piscic. Ittiop.* 16(3):86-90, 93-94, 97-98, 100-104. July-Sept. 1981. In English and Italian. SFA 27(1)
[Fac. Cienc. Vet., Univ. Cent. Venezuela, Maracay, Venezuela]

82-000363 Leong, T. S. and A. S. bin Mokhtar. PARASITES OF FRESHWATER FISH FROM ALOR STAR AND SUNGEI PETANI FISH MARKETS, KEDAH. *Malay. Nat. J.* 34(3):135-141. Mar. 1981. SFA 27(1)
[Sch. Biol. Sci., Univ. Sains Malaysia, Penang, Malaysia]

BACTERIAL DISEASES

82-000364 Austin, B.; D. A. Morgan and D. J. Alderman. COMPARISON OF ANTIMICROBIAL AGENTS FOR CONTROL OF VIBRIOSIS IN MARINE FISH. *Aquaculture* 26(1-2):1-12. Nov. 1981. SFA 27(1)
[Minist. Agric. Fish. Food, Dir. Fish. Res., Fish. Dis. Lab., Weymouth, Dorset DT4 8UB, England] From a comparison of 121 antimicrobial agents, the usefulness of substituted quinolines, in particular halquinol, has been indicated for the control of vibriosis in marine fish. From in vitro and in vivo experiments, it was deduced that halquinol inactivated rapidly the bacterial isolates, and controlled the disease manifestation in turbot (*Scophthalmus maximus* L.).

82-000365 Cipriano, R. C.; B. R. Griffin and B. C. Lidgerding. *AEROMONAS SALMONICIDA*: RELATIONSHIP BETWEEN EXTRACELLULAR GROWTH PRODUCTS AND ISOLATE VIRULENCE. *Can. J. Fish. Aquatic Sci.* 38(11):1322-1326. Nov.

BACTERIAL DISEASES (CONTINUED)

82-000365 CONTINUED 1981. SFA 27(1)
[U.S. FWS, Natl. Fish Health Res. Lab., Rt. 3, Box 40E, Kearneyville, WV 25430]

82-000366 Ishihara, S. and R. Kusuda. [EXPERIMENTAL INFECTION OF ELVERS AND ANGUILLETTES WITH *EDWARDSIELLA TARDA* BACTERIAL.] *Bull. Jpn. Soc. Sci. Fish.* 47(8):999-1002. Aug. 1981. In Japanese with English summ. SFA 27(1)
[Fish Dis. Lab., Fac. Agric., Kochi Univ., Nankoku, Kochi 783, Japan]

82-000367 Khan, R. A.; J. Campbell and H. Lear. MORTALITY IN CAPTIVE ATLANTIC COD, *GADUS MORHUA*, ASSOCIATED WITH FIN ROT DISEASE. *J. Wildl. Dis.* 17(4):521-527. Oct. 1981. SFA 27(1)
[Dep. Fish. Oceans, P.O. Box 5667, St. John's, NF A1C 5X1, Canada]

82-000368 Kimura, T. and M. Yoshimizu. [RAPID METHOD FOR DETECTION OF BACTERIAL KIDNEY DISEASE OF SALMONID (BKD) BY COAGGLUTINATION OF ANTIBODY SENSITIZED PROTEIN A-CONTAINING STAPHYLOCOCCI.] *Bull. Jpn. Soc. Sci. Fish.* 47(9):1173-1183. Sept. 1981. In Japanese with English summ. SFA 27(1)
[Lab. Microbiol., Fac. Fish., Hokkaido Univ., Minato-3, Hakkodate 041, Japan]

82-000369 Kusuda, R.; A. Sugiyama; K. Kawai; Y. Inada and M. Yoneda. [PATHOGENECITY OF *STREPTOCOCCUS* SP. AND *VIBRIO ANGUILLARUM* IN CULTURED AYU.] *Bull. Jpn. Soc. Sci. Fish.* 47(8):993-997. Aug. 1981. In Japanese with English summ. SFA 27(1)
[Fish Dis. Lab., Fac. Agric., Kochi Univ., Nankoku, Kochi 783, Japan]

82-000370 Michel, C. A BACTERIAL DISEASE OF PERCH (*PERCA FLUVIATILIS* L.) IN AN ALPINE LAKE: ISOLATION AND PRELIMINARY STUDY OF THE CAUSATIVE ORGANISM. *J. Wildl. Dis.* 17(4):505-510. Oct. 1981. SFA 27(1)
[Lab. Ichtyopathol., Stn. Rech. Virol. Immunol., Route de Thiverval, 78850 Thiverval-Grignon, France]

82-000371 Sugimoto, N.; S. Kashiwagi and T. Matsuda. [CUMARATIVE EFFECT OF CHEMOTHERAPEUTIC AGENTS BY MEDICATED BATH ON THE COLUMNARIS DISEASE OF CULTURED EEL.] *Bull. Jpn. Soc. Sci. Fish.* 47(9):1141-1148. Sept. 1981. In Japanese with English summ. SFA 27(1)
[UENO Fine Chem. Indus. Co., Ltd., Res. Lab., 127, Higashiarioka-1, 1 Itami, Hyogo 664, Japan]

82-000372 Sugiyama, A.; R. Kusuda; K. Kawai; Y. Inada and M. Yoneda. THE BEHAVIOR OF *STREPTOCOCCUS* SP. BACTERIA IN THE ORGANS OF INFECTED AYU. *Bull. Jpn. Soc. Sci. Fish.* 47(8):1003-1007. Aug. 1981. SFA 27(1)
[Fish Dis. Lab., Fac. Agric., Kochi Univ., Nankoku, Kochi 783, Japan]

PROTOZOAN DISEASES

82-000373 Chan, G. A STUDY OF SOME PARASITES OF THE WHITE SUCKER, *CATOSTOMUS COMMERSONI* (LACEPEDE), AND THE FATHEAD MINNOW, *PIMEPHALES PROMELAS* RAFINESQUE, IN A RESERVOIR AND ITS CONTIGUOUS STREAMS. *Ph.D.*

PROTOZOAN DISEASES (CONTINUED)

82-000373 CONTINUED *dissertation, Univ. Waterloo (Canada)* 1981. From Diss. Abstr. Int. B Sci. Eng. 42(5):1753. Nov. 1981. SFA 27(1)

82-000374 Cloutman, D. G.; R. D. Harrell and L. E. Miller. SOME OBSERVATIONS ON *EPISTYLIS* (CILIATA: PERITRICHA) INFESTATIONS ON FISHES FROM NINETY-NINE ISLANDS IMPOUNDMENT, CHEROKEE COUNTY, SOUTH CAROLINA. *Duke Power Co.* DUKEPWR/78-01. 20p. Mar. 1978. SFA 27(1)
[Duke Power Co., Charlotte, NC]

82-000375 Kabata, Z. and D. J. Whitaker. TWO SPECIES OF *KUDOA* (MYXOSPOREA: MULTIVALVULIDA) PARASITIC IN THE FLESH OF *MERLUCCIUS PRODUCTUS* (AYRES, 1855) (PISCES: TELEOSTEI) IN THE CANADIAN PACIFIC. *Can. J. Zool.* 59(11):2085-2091. Nov. 1981. In English with French summ. SFA 27(1)
[Dep. Fish. Oceans, Resour. Serv. Br., Pac. Biol. Stn., Nanaimo, BC V9R 5K6, Canada]

82-000376 Olson, R. E. EFFECTS OF LOW TEMPERATURE ON THE DEVELOPMENT OF THE MICROSPORIDAN *GLUGEA STEPHANI* IN ENGLISH SOLE (*PAROPHRYS VETULUS*). *J. Wildl. Dis.* 17(4):559-562. Oct. 1981. SFA 27(1)
[Dep. Fish. Wildl., Oreg. State Univ. Mar. Sci. Cent., Newport 97365]
Glugea stephani requires temperatures above 15 C for development in juvenile pleuronectid flatfishes in Yaquina Bay, Oregon. The effect of low temperature (10 C) on the development of recently established parasites was tested experimentally in juvenile English sole (*Parophrys vetulus*). Low temperature arrested parasite development, but did not kill the protozoan which resumed development on return to 19-20 C after as long as 42 days at 10 C. No parasites detectable with the light microscope were found in fish examined after 70 days at 10 C. Although most juvenile English sole move permanently from the estuary to cooler ocean waters in the fall and do not contribute to the continuation of the parasite life cycle, the cyle may be maintained by low numbers of English sole that overwinter in the estuary.

82-000377 Roche, D. P.; J. S. Carter and R. E. Hamme. SEASONAL DISTRIBUTION OF THE CILIATE PROTOZOAN *EPISTYLIS* IN THE PLANKTON, AND ITS PREVALENCE ON THREE CENTRARCHID FISHES, IN LAKE NORMAN, NORTH CAROLINA. *Duke Power Co.* DUKEPWR/78-03. Apr. 1978. SFA 27(1)
[Duke Power Co., Charlotte, NC]

OTHER DISEASES AND PARASITES

82-000378 Anderson, M. *ERGENSTREMA LABROSI* SP. NOV. (MONOGENEA) ON THE GILLS OF THE THICK-LIPPED GREY MULLET *CHELON LABROSUS* AT PLYMOUTH. *J. Mar. Biol. Assoc. U.K.* 61(4):827-832. Nov. 1981. SFA 27(1)
[Gatty Mar. Lab., Univ. St. Andrews, St. Andrews, Scotland]

82-000379 Anderson, M. THE CHANGE WITH HOST AGE OF THE COMPOSITION OF THE ANCYROCEPHALINE (MONOGENEAN) POPULATIONS OF PARASITES ON THICK-LIPPED GREY MULLETS AT PLYMOUTH. *J. Mar. Biol. Assoc. U.K.* 61(4):833-842. Nov. 1981. SFA 27(1)
[Gatty Mar. Lab., Univ. St. Andrews, St. Andrews, Scotland]

OTHER DISEASES AND PARASITES (CONTINUED)

82-000380 Appy, R. G. SPECIES OF *ASCAROPHIS* VAN BENEDEN, 1870 (NEMATODA: CYSTIDICOLIDAE) IN NORTH ATLANTIC FISHES. *Can. J. Zool.* 59(11):2193-2205. Nov. 1981. In English with French summ. SFA 27(1)
[Dep. Zool., Coll. Biol. Sci., Univ. Guelph, Guelph, ON N1G 2W1, Canada]

82-000381 Beverley-Burton, M. *ACTINOCLEIDUS OCULATUS* (MUELLER, 1934) AND *A. RECURVATUS* MIZELLE AND DONAHUE, 1944 (MONOGENEA: ANCYROCEPHALINAE) FROM *LEPOMIS GIBBOSUS* L. (PISCES: CENTRARCHIDAE) IN ONTARIO, CANADA: ANATOMY AND SYSTEMATIC POSITION. *Can. J. Zool.* 59(9):1810-1817. Sept. 1981. In English with French summ. SFA 27(1)
[Dep. Zool., Univ. Guelph, Guleph, ON N1G 2W1, Canada]

82-000382 Cone, D. K. and M. D. B. Burt. THE INVASION ROUTE OF THE GILL PARASITE *UROCLEIDUS ADSPECTUS* MUELLER, 1936 (MONOGENEA: ANCYROCEPHALINAE). *Can. J. Zool.* 59(11):2166-2171. Nov. 1981. In English with French summ. SFA 27(1)
[Dep. Fish. Oceans, P.O. Box 5667, St. John's, NF A1C 5X1, Canada]

82-000383 Cone, D. K. THE BIOLOGY OF *UROCLEIDUS ADSPECTUS* (MONOGENEA) PARASITIZING *PERCA FLAVESCENS*. *Ph.D. dissertation, Univ. New Brunswick* 1980. From Diss. Abstr. Int. B Sci. Eng. 42(6):2258. Dec. 1981. SFA 27(1)

82-000384 Engelman, R. W. EXOPHTHALMOS IN MARINE FISH. *Am. Assoc. Zool. Parks Aquariums Annu. Conf. Proc.* p. 89-98. 1981. SFA 27(1)
[Vancouver Publ. Aquarium, P.O. Box 3232, Vancouver, BC V6B 3X8, Canada]

82-000385 Gibson, D. I.; K. MacKenzie and J. Cottle. *HALVORSENIUS EXILIS* GEN. ET SP. NOV., A NEW DIDYMOZOID TREMATODE FROM THE MACKEREL *SCOMBER SCOMBRUS* L. *J. Nat. Hist.* 15(6):917-929. Nov.-Dec. 1981. SFA 27(1)
[Zool. Dep., Brit. Mus. (Nat. Hist.), Cromwell Rd., London SW7 5BD, England]

82-000386 Mayes, M. A.; D. R. Brooks and T. B. Thorson. *POTAMOTRYGONOCOTYLE TSALICKISI*, NEW GENUS AND SPECIES (MONOGENEA: MONOCOTYLIDAE) AND *PARAHETERONCHOCOTYLE AMAZONENSIS*, NEW GENUS AND SPECIES (MONOGENEA: HEXABOTHRIIDAE) FROM *POTAMOTRYGON CIRCULARIS* GARMAN (CHONDRICHTHYES: POTAMOTRYGONIDAE) IN NORTHWESTERN BRAZIL. *Proc. Biol. Soc. Wash.* 94(4):1205-1210. 31 Dec. 1981. SFA 27(1)
[Environ. Sci. Res., 1702 Bldg., Dow Chemical Co., Midland, MI 48640]

82-000387 Munroe, T. A.; R. A. Campbell and D. E. Zwerner. *DICLIDOPHORA NEZUMIAE* SP. N. (MONOGENEA: DICLIDOPHORIDAE) AND ITS ECOLOGICAL RELATIONSHIPS WITH THE MACROURID FISH *NEZUMIA BAIRDII* (GOODE AND BEAN, 1877). *Biol. Bull. (Woods Hole)* 161(2):281-290. Oct. 1981. SFA 27(1)
[Va. Inst. Mar. Sci., Coll. William and Mary, Gloucester Point 23062]

82-000388 Nagasawa, K. and S. Egusa. *ACANTHOCEPHALUS LUCIDUS* VAN CLEAVE (ACANTHOCEPHALA: ECHINORHYNCHIDAE) FROM CULTURED RAINBOW TROUT *SALMO GAIRDNERI* RICHARDSON. *Bull. Jpn. Soc. Sci. Fish.* 47(9):1153-1156. Sept. 1981. SFA 27(1)
[Dep. Fish., Fac. Agric., Univ. Tokyo, Bunkyo, Tokyo 113, Japan]

OTHER DISEASES AND PARASITES (CONTINUED)

82-000389 Nicol, J. A. C. CORNEAL INJURIES IN THE ATLANTIC STINGRAY *DASYATIS SABINA* (LESUEUR). *Contrib. Mar. Sci.* 24:1-8. Sept. 1981. SFA 27(1)
[Ribby, Lerryn, Lostwithiel, Cornwall, PL22 0PG, England]

82-000390 Pawaputanon, K. EFFECTS OF PARASITIC COPEPOD, *SALMINCOLA CALIFORNIENSIS* (DANA, 1852) ON JUVENILE SOCKEYE SALMON, *ONCORHYNCHUS NERKA* (WALBAUM). *Ph.D. dissertation, Univ. British Columbia* 1980. From Diss. Abstr. Int. B Sci. Eng. 42(6):2262. Dec. 1981. SFA 27(1)

82-000391 Williams, L. B. and E. H. Williams, Jr. NINE NEW SPECIES OF *ANILOCRA* (CRUSTACEA: ISOPODA: CYMOTHOIDAE) EXTERNAL PARASITES OF WEST INDIAN CORAL REEF FISHES. *Proc. Biol. Soc. Wash.* 94(4):1005-1047. 31 Dec. 1981. SFA 27(1)
[Dep. Mar. Sci., Univ. Puerto Rico, Mayaguez 00708]

POLLUTION

82-000392 Birnie, S. E. and D. J. Hodges. DETERMINATION OF IONIC ALKYL LEAD SPECIES IN MARINE FAUNA. *Environ. Technol. Lett.* 2(10):433-442. Oct. 1981. SFA 27(1)
[Assoc. Octel Co. Ltd., Res. Dev. Dep., Ellesmere Port, South Wirral, L65 4HF, England]

82-000393 Christie, A. E. THE CALCUATION OF TEMPERATURE GUIDELINES TO PROTECT FISH RESIDENT IN THE OTTAWA RIVER: A PREDICTIVE MODEL. *Int. Ver. Theor. Angew. Limnol. Verh.* 21(Part 2):1238-1243. 1981. SFA 27(1)
[Ontario Hydro, 700 University Ave., Toronto, ON M5G 1X6, Canada]

82-000394 Fischer, J. M. THE AVAILABILITY OF PRIVATE REMEDIES FOR ACID RAIN DAMAGE. *Ecol. Law Q.* 9(3):429-487. 1981. SFA 27(1)
[Southwest. Sch. Law, Los Angeles, CA]

82-000395 Galassi, S.; G. Gandolfi; G. Pacchetti. CHLORINATED HYDROCARBONS IN FISH FROM THE RIVER PO (ITALY). *Sci. Total Environ.* 20(3):231-240. Oct. 1981. SFA 27(1)
[Ist. Ricerca Agric. - CNR, Reparto Idrobiol. Appl., Brugherio, Milan, Italy]

82-000396 Gordon, M. S.; D. J. Chapman; L. Y. Kawasaki; E. Tarifeño-Silva and D. P. Yu. AQUACULTURAL APPROACHES TO RECYCLING OF DISSOLVED NUTRIENTS IN SECONDARILY TREATED DOMESTIC WASTEWATERS-IV. CONCLUSIONS, DESIGN AND OPERATIONAL CONSIDERATIONS FOR ARTIFICIAL FOOD CHAINS. *Water Res.* 16(1):67-71. 1982. SFA 27(1)
[Dep. Biol., Univ. Calif., Los Angeles 90024]

82-000397 Griswold, C. A., (ed.). THE BARGE *OCEAN 250* GASOLINE SPILL. *NOAA Tech. Rep. NMFS SSRF* 751. iv + 30p. Nov. 1981. SFA 27(1)
[NMFS, South Ferry Rd., Naragansett, RI 02882]

POLLUTION (CONTINUED)

82-000398 Haines, T. A. ACIDIC PRECIPITATION AND ITS CONSEQUENCES FOR AQUATIC ECOSYTEMS: A REVIEW. *Trans. Am. Fish. Soc.* 110(6):669-707. Nov. 1981. SFA 27(1)
[U.S. FWS, Columbia Natl. Fish. Res. Lab. Field Res. Stn., Univ. Me., Orono 04469]

82-000399 Harrell, R. D.; R. L. Fuller and T. J. Edwards. AN INVESTIGATION OF THE FISH COMMUNITY OF BELEWS LAKE NORTH CAROLINA. *Duke Power Co.* DUKEPWR/78-07. 64p. Oct. 1978. SFA 27(1)
[Duke Power Co., Charlotte, NC] Belews Lake provides a source of cooling water for the Belews Creek Steam Station (BCSS) located in Stokes County, North Carolina. This study, begun in 1976, was a continuation of a fish population evaluation study initiated by the North Carolina Wildlife Resources Commission (NCWRC) in 1971. This study revealed that the upper area of Belews Lake sustains an abundant and diverse adult and larval fish community, while the lower Belews Lake area supports few adult and larval fishes and exhibits little species diversity. Effects of the BCSS thermal discharges on the fishes of Belews Lake were limited to a general avoidance of the heated areas during the summer and fall months. Belews Lake flat bullheads generally grew faster and weighed slightly more than Lake Norman bullheads. Belews Lake bluegill grew slightly slower than those of most other North Carolina lakes and consistently weighed less than fish of equal lengths from other waters. Flat bullheads, green sunfish, and bluegill fed mainly on aquatic invertebrates (primarily insects).

82-000400 Higler, L. W. G. and F. F. Repko. THE EFFECTS OF POLLUTION IN THE DRAINAGE AREA OF A DUTCH LOWLAND STREAM ON FISH AND MACRO-INVERTEBRATES. *Int. Ver. Theor. Angew. Limnol. Verh.* 21(Part 2):1077-1082. 1981. SFA 27(1)
[Bilderdijklaan 120, Bilthoven, The Netherlands]

82-000401 Hocutt, C. H. FISH AS INDICATORS OF BIOLOGICAL INTEGRITY. *Fisheries (Bull. Am. Fish. Soc.)* 6(6):28-31. Nov.-Dec. 1981. SFA 27(1)
[Univ. Md., Horn Point Environ Lab., Cent. Environ. Estuarine Stud., Cambridge 21613]

82-000402 International Council for the Exploration of the Sea. RESEARCH ACTIVITIES RELATED TO OIL POLLUTION INCIDENTS. *Int. Counc. Explor. Sea Coop. Res. Rep.* No. 107. 51p. July 1981. SFA 27(1)
[Palægade 2-4, DK-1261 Copenhagen K, Denmark]

82-000403 Karr, J. R. ASSESSMENT OF BIOTIC INTEGRITY USING FISH COMMUNITIES. *Fisheries (Bull. Am. Fish. Soc.)* 6(6):21-27. Nov.-Dec. 1981. SFA 27(1)
[Dep. Ecol. Ethol. Evol., Univ. Ill., Urbana 61820]

82-000404 Kawasaki, L. Y.; E. Tarifeño-Silva; D. P. Yu; M. S. Gordon and D. J. Chapman. AQUACULATURAL APPROACHES TO RECYCLING OF DISSOLVED NUTRIENTS IN SECONDARILY TREATED DOMESTIC WASTEWATERS-I. NUTRIENT UPTAKE AND RELEASE BY ARTIFICIAL FOOD CHAINS. *Water Res.* 16(1):37-49. 1982. SFA 27(1)
[Environ. Anal. Off., Port Los Angeles, CA 90733]

82-000405 Klauda, R. J.; T. H. Peck and G. K. Rice. ACCUMULATION OF POLYCHLORINATED BIPHENYLS IN ATLANTIC TOMCOD (*MICROGADUS TOMCOD*) COLLECTED FROM THE HUDSON RIVER ESTUARY, NEW YORK. *Bull. Environ. Contam.*

POLLUTION (CONTINUED)

82-000405 CONTINUED *Toxicol.* 27(6):829-835. Dec. 1981. SFA 27(1)
[Johns Hopkins Univ., Appl. Phys. Lab., Aquatic Ecol. Sect., Shady Side, MD 20764]

82-000406 Kuehl, D. W.; K. L. Johnson; B. C. Butterworth; E. N. Leonard and G. D. Veith. QUANTIFICATION OF OCTACHLOROSTYRENE AND RELATED COMPOUNDS IN GREAT LAKES FISH BY GAS CHROMATOGRAPHY - MASS SPECTROMETRY. *J. Great Lakes Res.* 7(3):330-335. 1981. SFA 27(1)
[U.S. EPA, 6201 Congdon Blvd., Duluth, MN 55804]

82-000407 Mattheeuws, A.; M. Genin; A. Detollenaere and J.-C. Micha. ETUDE DE LA REPRODUCTION DU GARDON (*RUTILUS RUTILUS*) ET DES EFFETS D'UNE ÉLÉVATION PROVOQUÉE DE LA TEMPÉRATURE EN MEUSE SUR CETTE REPRODUCTION. [STUDY OF THE REPRODUCTION OF ROACH (*RUTILUS RUTILUS*) AND THE EFFECTS OF THERMAL POLLUTION IN THE MEUSE ON THE REPRODUCTIVE CYCLE.] *Hydrobiologia* 85(3):271-282. 4 Dec. 1981. In French with English summ. SFA 27(1)
[Lab. Ecol., Eaux Douces, Fac. Univ., Rue de Bruxelles 61, B-5000 Namur, Belgium] The thermal pollution of the Tihange Nuclear Power Plant increases the temperature)±3°C) of the river Meuse and has precise effects on the reproductive cycle of the roach (*Rutilus rutilus*) downstream: well-defined, ovarial development, acceleration of maturation, and earlier laying of eggs (3 weeks). The volume of the different testicular cell types appears to be more important in males downstream. Spermatozoa are retained for a longer period in both populations (upstream and downstream) as a result of diminished spawning-grounds along the river.

82-000408 Niimi, A. J. and C. Y. Cho. ELIMINATION OF HEXACHLOROBENZENE (HCB) BY RAINBOW TROUT (*SALMO GAIRDNERI*), AND AN EXAMINATION OF ITS KINETICS IN LAKE ONTARIO SALMONIDS. *Can. J. Fish. Aquatic Sci.* 38(11):1350-1356. Nov. 1981. SFA 27(1)
[Great Lakes Biolimnol. Lab., Burlington, ON L7R 4A6, Canada]

82-000409 Nuorteva, P.; M. Lodenius and S.-L. Nuorteva. DECREASE IN THE MERCURY LEVELS OF *ESOX LUCIUS* (L.) AND *ABRAMIS FARENUS* (L.) (TELEOSTEI) IN THE HÄMEENKYRÖ WATERCOURSE AFTER THE PHENYLMERCURY BAN IN FINLAND. *Aquilo* 19:97-100. 1979. SFA 27(1)
[Dep. Environ. Sci., Univ. Helsinki, Helsinki, Finland]

82-000410 O'Grady, K. T. THE RESORPTION OF ZINC FROM SCALES OF SEA TROUT (*SALMO TRUTTA*) DURING THE UPSTREAM SPAWNING MIGRATION. *Freshwater Biol.* 11(6):561-565. Dec. 1981. SFA 27(1)
[Freshwater Fish. Unit, Dep. Zool., Univ. Liverpool, England]

82-000411 Prete, P. J.; T. L. Beitinger and J. A. Stanford. BEHAVIORAL AVOIDANCE OF ACIDIC LAKEWATER BY BLUEGILL, *LEPOMIS MACROCHIRUS* (CENTRARCHIDAE). *Southwest Nat.* 26(4):433-436. 20 Nov. 1981. SFA 27(1)
[Dep. Biol. Sci., Inst. Appl. Sci., North Tex. State Univ., Denton 76203]

82-000412 Rodgers, D. W. and F. W. H. Beamish. UPTAKE OF WATERBORNE METHYLMERCURY BY RAINBOW TROUT (*SALMO GAIRDNERI*) IN RELATION TO OXYGEN CONSUMPTION AND METHYLMERCURY CONCENTRATION. *Can. J. Fish. Aquatic Sci.* 38(11):1309-1315. Nov. 1981. SFA 27(1)
[Dep. Zool., Univ. Guelph, Guelph, ON N1G 2W1, Canada]

POLLUTION (CONTINUED)

82-000413 Ryan, P. M. and H. H. Harvey. FACTORS ACCOUNTING FOR VARIATION IN THE GROWTH OF ROCK BASS (*AMBLOPLITES RUPESTRIS*) AND YELLOW PERCH (*PERCA FLAVESCENS*) IN THE ACIDIFYING LA CLOCHE MOUNTAIN LAKES OF ONTARIO, CANADA. *Int. Ver. Theor. Angew. Limnol. Verh.* 21(Part 2):1231-1237. 1981. SFA 27(1)
[Dep. Fish. Oceans, P.O. Box 5667, St. John's, NF A1C 5X1, Canada]

82-000414 Sloane-Richey, J.; M. A. Perkins and K. W. Malueg. THE EFFECTS OF URBANIZATION AND STORMWATER RUNOFF ON THE FOOD QUALITY IN TWO SALMONID STREAMS. *Int. Ver. Theor. Angew. Limnol. Verh.* 21(Part 2):812-818. 1981. SFA 27(1)
[Dep. Civ. Eng., Univ. Wash., Seattle 98195]

82-000415 Tarifeño-Silva, E.; L. Y. Kawasaki; D. P. Yu; M. S. Gordon and D. J. Chapman. AQUACULTURAL APPROACHES TO RECYCLING OF DISSOLVED NUTRIENTS IN SECONDARILY TREATED DOMESTIC WASTEWATERS-II. BIOLOGICAL PRODUCTIVITY OF ARTIFICIAL FOOD CHAINS. *Water Res.* 16(1):51-57. 1982. SFA 27(1)
[Dep. Biol. Technol. Mar., Univ. Católica, Talcahuano, Chile]

82-000416 Tarifeño-Silva, E.; L. Y. Kawasaki; D. P. Yu; M. S. Gordon and D. J. Chapman. AQUACULTURAL APPROACHES TO RECYCLING OF DISSOLVED NUTRIENTS IN SECONDARILY TREATED DOMESTIC WASTEWATERS-III. UPTAKE OF DISSOLVED HEAVY METALS BY ARTIFICIAL FOOD CHAINS. *Water Res.* 16(1):59-65. 1982. SFA 27(1)
[Dep. Biol. Technol. Mar., Univ. Católica, Talcahuano, Chile]

82-000417 van den Broek, W. L. F. and D. M. Tracey. CONCENTRATION AND DISTRIBUTION OF MERCURY IN FLESH OF ORANGE ROUGHY *(HOPLOSTETHUS ATLANTICUS). N.Z. J. Mar. Freshwater Res.* 15(3):255-260. 1981. SFA 27(1)
[Fish. Res. Div., Minist. Agric. Fish., P.O. Box 297, Wellington, New Zealand]

82-000418 Verma, S. R.; M. Jain and R. C. Dalela. *IN VIVO* REMOVAL OF A FEW HEAVY METALS IN CERTAIN TISSUES OF THE FISH *NOTOPTERUS NOTOPTERUS. Environ. Res.* 26(2):328-334. Dec. 1981. SFA 27(1)
[Pollut. Relevant Res. Lab., P.B. 264, Post-Grad. Dep. Zool., D.A.V. Coll., Muzaffarnagar 251 001, India]

82-000419 Yasuno, M.; J. Okita; K. Saito; Y. Nakamura; S. Hatakeyama and S. Kasuga. EFFECTS OF FENITROTHION ON BENETHIC FAUNA IN SMALL STREAMS OF MT. TSUKUBA, JAPAN. *Jpn. J. Ecol.* 31(3):237-245. Sept. 1981. SFA 27(1)
[Natl. Inst. Environ. Stud., Tsukuba, 305 Japan]

FISH KILLS

82-000420 Cardeilhac, P. T.; C. F. Simpson; F. H. White; N. P. Thompson and W. E. Carr. EVIDENCE FOR METAL POISONING IN ACUTE DEATHS OF LARGE RED DRUM (*SCIAENOPS OCELLATA*). *Bull. Environ. Contam. Toxicol.* 37(5):639-644. Nov. 1981. SFA 27(1)
[Coll. Vet. Med., Univ. Fla., Gainesville, FL 32610]

TOXICOLOGY; BIOASSAYS

82-000421 Arillo, A.; C. Margiocco; F. Melodia and P. Mensi. EFFECTS OF AMMONIA ON LIVER LYSOSOMAL FUNCTIONALITY IN *SALMO GAIRDNERI* RICH. *J. Exp. Zool.* 218(3):321-326. Dec. 1981. SFA 27(1)
[Ist. Zool., Univ. Genova, 16126 Genova, Italy]

82-000422 Barton, B. A. and H. Helfrich. TIME-DOSE RESPONSES OF JUVENILE RAINBOW TROUT TO 2-PHENOXYETHANOL. *Prog. Fish.-Cult.* 43(4):223. Oct. 1981. SFA 27(1)
[Fish. Br., Minist. Nat. Resour., Queen's Park, Toronto, ON M7A 1W3, Canada]

82-000423 Dixon, D. G. and J. W. Hilton. INFLUENCE OF AVAILABLE DIETARY CARBOHYDRATE CONTENT ON TOLERANCE OF WATERBORNE COPPER BY RAINBOW TROUT, *SALMO GAIRDNERI* RICHARDSON. *J. Fish Biol.* 19(5):509-517. Nov. 1981. SFA 27(1)
[Dep. Biol., Univ. Waterloo, Waterloo, ON N2L 3G1, Canada]

82-000424 Geraudie, J. CONSEQUENCES OF CELL DEATH AFTER NITROGEN MUSTARD TREATMENT ON SKELETAL PELVIC FIN MORPHOGENESIS IN THE TROUT, *SALMO GAIRDNERI* (PISCES, TELEOSTEI). *J. Morphol.* 170(2):181-194. Nov. 1981. SFA 27(1)
[Univ. Paris VII, Lab. Anat. Comp., 75251 Cedex 05, Paris, France]

82-000425 Heitmuller, P. T.; T. A. Hollister and P. R. Parish. ACUTE TOXICITY OF 54 Industrial Chemicals to Sheepshead Minnows (*CYPRINODON VARIEGATUS*). *Bull. Environ. Contam. Toxicol.* 27(5):596-604. Nov. 1981. SFA 27(1)
[EG & G Bionomics, Mar. Res. Lab., 10307 Gulf Beach Highway, Pensacola, FL 32507]

82-000426 Hunt, T. P.; J. W. Fisher; J. M. Livingston and M. E. Putnam. TEMPERATURE EFFECTS ON HYDRAZINE TOXICITY TO BLUEGILLS. *Bull. Environ. Contam. Toxicol.* 27(5):588-595. Nov. 1981. SFA 27(1)
[Air Force Aerospace Med. Res. Lab., Toxic Hazards Div., Environ. Qual. Br., Wright-Patterson Air Force Base, OH 45433]

82-000427 Kocan, R. M.; M. L. Landolt; J. Bond and E. P. Benditt. *IN VITRO* EFFECT OF SOME MUTAGENS/CARCINOGENS ON CULTURED FISH CELLS. *Arch. Environ. Contam. Toxicol.* 10(6):663-671. Nov. 1981. SFA 27(1)
[Dep. Pathol., Univ. Wash., Seattle 98195]

82-000428 Law, F. C. P. and R. F. Addison. RESPONSE OF TROUT HEPATIC MIXED-FUNCTION OXIDASES TO EXPERIMENTAL FEEDING OF TEN KNOWN OR POSSIBLE CHLORINATED ENVIRONMENTAL CONTAMINANTS. *Bull. Environ. Contam. Toxicol.* 27(5):605-609. Nov. 1981. SFA 27(1)
[Coll. Pharm., Dalhousie Univ., Halifax, NS, Canada]

82-000429 McBride, J. R.; H. M. Dye and E. M. Donaldson. STRESS RESPONSE OF JUVENILE SOCKEYE SALMON (*ONCORHYNCHUS NERKA*) TO THE BUTOXYETHANOL ESTER OF 2,4-DICHLOROPHENOXYACETIC ACID. *Bull. Environ. Contam. Toxicol.*

TOXICOLOGY; BIOASSAYS (CONTINUED)

82-000429 CONTINUED 27(6):877-884. Dec. 1981. SFA 27(1)
[Resour. Serv. Br., 4160 Marine Dr., West Vancouver, BC, Canada]

82-000430 Michibata, H. UPTAKE AND DISTRIBUTION OF CADMIUM IN THE EGG OF THE TELEOST, *ORYZIAS LATIPES*. *J. Fish Biol.* 19(6):691-696. Dec. 1981. SFA 27(1)
[Biol. Inst., Fac. Sci., Toyama Univ., Toyama 930, Japan] Eggs of *Oryzias latipes* in the blastula stage were exposed to M/100 artifical sea water which contained cadmium at the concentrations of 0·1, 1·0, 10·0, 20·0 or 50·0 mg l^{-1}. The 96 h TL_{50} value for cadmium was estimated to be 20·5 mg l^{-1}. When the eggs were incubated for 24 h in the M/100 sea water with 10·0 mg Cd l^{-1} and then rinsed in glycine buffer solution (pH; 2·0), the cadmium content of the egg decreased markedly. Cadmium levels were determined in parts of the embryonic body, the chorion and the yolk sac. The most cadmium was detected in the chorion (94·6%). Prolonged cadmium exposure revealed that most of the cadmium was absorbed by the chorion and little was detected in the embryonic body and the yolk sac.

82-000431 Murthy, V. K.; P. Reddanna; M. Bhaskar and S. Govindapa. MUSCLE METABOLISM OF FRESHWATER FISH, *TILAPIA MOSSAMBICA* (PETERS), DURING ACUTE EXPOSURE AND ACCLIMATION TO SUBLETHAL ACIDIC WATER. *Can. J. Zool.* 59(10):1909-1915. Oct. 1981. In English with French summ. SFA 27(1)
[Fish Physiol. Div., Dep. Zool., Sri Venkateswara Univ., Tirupati, 517 504 (A.P.) India]

82-000432 Nyman, H.-G. SUBLETHAL EFFECTS OF LEAD (Pb) ON SIZE SELECTIVE PREDATION BY FISH-APPLICATIONS ON THE ECOSYSTEM LEVEL. *Int. Ver. Theor. Angew. Limnol. Verh.* 21(Part 2):1126-1130. 1981. SFA 27(1)
[Dep. Zool., Univ. Göteborg, Box 250 59, S-400 31, Göteborg, Sweden]

82-000433 Ofstad, E. B.; H. Drangsholt and G. E. Carlberg. ANALYSIS OF VOLATILE HALOGENATED ORGANIC COMPOUNDS IN FISH. *Sci. Total Environ.* 20(3):205-215. Oct. 1981. SFA 27(1)
[Cent. Inst. Indus. Res., Blindern, Oslo 3, Norway]

82-000434 Pant, S. C. and S. Kumar. TOXICITY OF TEMIK (ALDICARB) FOR A FRESH WATER TELEOST, *BARBUS CONCHONIUS* HAMILTON. *Experientia (Basel)* 37(12):1327-1328. 15 Dec. 1981. SFA 27(1)
[Dep. Zool., Kumaun Univ., D.S.B. Campus, Nainital 263 002, India]

82-000435 Petukhov, S. A. and N. G. Storozhuk. TOXIC EFFECT OF MERCURY ON SALMON LARVAL, *ONCORHYNCHUS KETA* AND *O. KISUTCH*. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):138-141. 1980. SFA 27(1)
[VNIRO, Moscow, USSR] On the basis of the dynamics of the concentration of trace elements in larval chum and coho salmon under normal conditions and under the influence of mercury, and of the level of concentration of the toxicant in larvae and the percent mortality in the course of the experiment it is concluded that the toxic effect of mercury has a specific mechanism that blocks the biosynthesis of proteins and displaces biologically active metals from metalloproteins.

82-000436 Richardson, L. B.; D. T. Burton and J. C. Rhoderick. TOXICITY OF BROMATE TO STRIPED BASS ICHTHYOPLANKTON (*MORONE SAXATILIS*) AND JUVENILE SPOT (*LEIOSTOMUS XANTHURUS*). *J. Toxicol. Environ. Health* 8(4):687-695. Oct. 1981. SFA 27(1)
[Acad. Nat. Sci. Phila., Benedict Estuarine Res. Lab., Benedict, MD]

TOXICOLOGY; BIOASSAYS (CONTINUED)

82-000437 Saarikoski, J. and M. Viluksela. INFLUENCE OF pH ON THE TOXICITY OF SUBSTITUTED PHENOLS TO FISH. *Arch. Environ. Contam. Toxicol.* 10(6):747-753. Nov. 1981. SFA 27(1)
[Dep. Zool., Univ. Helsinki, Arkadiankatu 7, SF-00100 Helsinki 10, Finland]

82-000438 Sadler, K. THE TOXICITY OF AMONIA TO THE EUROPEAN EEL (*ANGUILLA ANGUILLA* L.). *Aquaculture* 26(1-2):173-181. Nov. 1981. SFA 27(1)
[C.E.R.L. Freshwater Biol. Unit, Ratcliffe-on-Soar Power Stn., Nottingham NG11 0EE, England] Elvers (mean weight 0.2g) and yellow eels (mean weight 2.8g) were exposed to unionised ammonia (NH_3) concentrations up to 22mg-N l^{-1} and their survival monitored over 10 days. Both age classes had a median period of survival in excess of 10 days at concentrations less than 1.0 mg-N l^{-1}. Above this level increased mortality occurred with increased ammonia concentration with the elvers being more susceptible than the larger eels. The growth rates of yellow eels were independent of unionised ammonia concentration up to approximately 0.12mg-N l^{-1}. Above this level growth rates decreased to near zero at 0.5mg-N l^{-1}.

82-000439 Sasaki, K.; M. Takeda and M. Uchiyama. TOXICITY, ABSORPTION AND ELIMINATION OF PHOSPHORIC ACID TRIESTERS BY KILLIFISH AND GOLDFISH. *Bull. Environ. Contam. Toxicol.* 27(6):775-782. Dec. 1981. SFA 27(1)
[Natl. Inst. Hygienic Sci., 18-1 Kamiyoga 1-chome, Setagaya-ku, Tokyo, Japan]

82-000440 Sorensen, E. M. B. and N. K. R. Smith. HEMOSIDERIN GRANULES: CYTOTOXIC RESPONSE TO ARSENIC EXPOSURE IN CHANNEL CATFISH. *Bull. Environ. Contam. Toxicol.* 27(5):645-653. Nov. 1981. SFA 27(1)
[Dep. Pharmacol., Univ. Tex., Austin 78712]

82-000441 Swarup, P. A.; D. M. Rao and A. S. Murty. TOXICITY OF ENDOSULFAN TO THE FRESHWATER FISH *CIRRHINUS MRIGALA*. *Bull. Environ. Contam. Toxicol.* 27(6):850-855. Dec. 1981. SFA 27(1)
[Dep. Zool., Nagarjuna Univ., Nagarjunanagar, S. India 522510]

82-000442 Tsai, C.-F. and K.-Y. Chang. EFFECT OF SEX AND SIZE ON COPPER SUSCEPTIBILITY OF THE COMMON GUPPY, *LEBISTES RETICULATUS* (PETER). *J. Fish Biol.* 19(6):683-689. Dec. 1981. SFA 27(1)
[Tracor Jitco, Inc., Rockville, MD] Multiple regression analyses were conducted to relate rate of toxin action, body weight and concentration for fry, male and female populations of *Lebistes reticulatus* exposed to copper solutions. For each of these three populations, copper susceptibility decreased as body weight increased. On the basis of the rate of toxic action adjusted with the size factor, the copper susceptibility differed significantly among the fry, male and female populations at the ratios of 2.20:1.55:1.00. When the size factor was not included in calculation, the rate of toxic action or median survival time did not show such a difference between the males and females.

FISH TOXICANTS

82-000443 Gilmore, R. G.; P. A. Hastings; G. R. Kulczycki and B. L. Jennison. CRYSTALLINE ROTENONE AS A SELECTIVE FISH TOXIN. *Fla. Sci.* 44(4):193-203. 1981. SFA 27(1)

FISH TOXICANTS (CONTINUED)

82-000443 CONTINUED
[Harbor Branch Found., Inc., RR 1, Box 196, Ft. Pierce, FL 33450] Field collections and laboratory bioassay experiments were conducted comparing various rotenone compounds and solutions with regard to their ability to stupefy and kill marine fish. Crystalline rotenone (97% pure rotenone), rotenone resin (42-45% rotenone) and premixed 5% emulsified rotenone solutions were tested as were alcohol, acetone, and Aromatic 150 solvents. Marine fish and invertebrates tested were both effected by emulsified rotenone while crystalline rotenone was more specific for fish and note the marine invertebrates tested. The pure emulsifier, ATLOX 3335 ®, caused fatalities in *Cyprinodon variegatus*.

RESEARCH AND MANAGEMENT-GENERAL

82-000444 Regier, H. A. OPTIMUM USE, FISHERIES MANAGEMENT. *Fisheries (Bull. Am. Fish. Soc.)* 6(5):4-7. Sept.-Oct. 1981. SFA 27(1)
[Dep. Zool., Univ. Toronto, Toronto, ON, Canada]

82-000445 Sissenwine, M. P. AN OVERVIEW OF SOME METHODS OF FISH STOCK ASSESSMENT. *Fisheries (Bull. Am. Fish. Soc.)* 6(6):31-35. Nov.-Dec. 1981. SFA 27(1)
[Northeast Fish. Cent., Woods Hole, MA]

ADMINISTRATION AND PLANNING

82-000446 Veiluva, M. THE FISH AND WILDLIFE COORDINATION ACT IN ENVIRONMENTAL LITIGATION. *Ecol. Law Q.* 9(3):489-517. 1981. SFA 27(1)

82-000447 Wiley, R. W. THOUGHTS AND REFLECTIONS ON ADMINISTRATION. *Fisheries (Bull. Am. Fish. Soc.)* 6(5):2-4. Sept.-Oct. 1981. SFA 27(1)
[Wyo. Game Fish Dep., Laramie]

REPORTS OF FISHERY STATIONS, STATES, ETC.

82-000448 Cope, O. B.,(ed.). COLORADO FISHERIES RESEARCH REVIEW 1978-1980. *Colo. Div. Wildl. Rev.* No. 10. viii + 83p. Sept. 1981. SFA 27(1)

82-000449 Scott, D. P. BIENNIAL REPORT - 1976-78, WESTERN REGION, FISHERIES AND MARINE SERVICE, DEPARTMENT OF FISHERIES AND THE ENVIRONMENT. *Can. Tech. Rep. Fish. Aquatic. Sci.* No. 1019. vi + 36p. Oct. 1981. In English and French. SFA 27(1)
[Dep. Fish. Oceans, Winnipeg, MB R3T 2N6, Canada]

82-000450 Sullivan, C. R. THE HISTORY, STRUCTURE, AND FUNCTION OF THE AMERICAN FISHERIES SOCIETY. *Fisheries (Bull. Am. Fish. Soc.)* 6(5):25-29. Sept.-Oct. 1981. SFA 27(1)
[Am. Fish. Soc., 5410 Grosvenor Lane, Bethesda, MD 20014]

HABITAT ALTERATIONS

82-000451 Eley, R.; J. Randolph and J. Carroll. A COMPARISION OF PRE- AND POST-IMPOUNDMENT FISH POPULATIONS IN THE MOUNTAIN FORK RIVER IN SOUTHEASTERN OKLAHOMA. *Proc. Okla. Acad. Sci.* 61:7-14. 1981. SFA 27(1)
[Waterways Exp. Stn., Vicksburg, MS] The purpose of this paper is to compare the composition and diversity of fish collections before and after the impoundment of the Mountain Fork River by Broken Bow Dam. The number of species reported has declined from 84 to 65 and diversity is lower after impoundment.

82-000452 Finnell, L. M. RESULTS OF FISHERIES INVESTIGATIONS AT TWIN LAKES, COLORADO 1973-76. *U.S. Dep. Interior Bur. Reclam.* REC-ERC-80-5. vi + 47p. Aug. 1981. SFA 27(1)
[Colo. Div. Wildl., 317 W. Prospect, Fort Collins 80526]

82-000453 Gore, J. A. and Judy, R. D., Jr. PREDICTIVE MODELS OF BENTHIC MACRONINVERTEBRATE DENSITY FOR USE IN INSTREAM FLOW STUDIES AND REGULATED FLOW MANAGEMENT. *Can. J. Fish. Aquatic Sci.* 38(11):1363-1370. Nov. 1981. SFA 27(1)
[Fac. Nat. Sci., Univ. Tulsa, 600 S. College Ave., Tulsa, OK 74104]

HARVEST, CREEL CENSUS, ETC.

82-000454 Browder, J. A.; J. C. Davis and E. Sullivan. PAYING-PASSENGER RECREATIONAL FISHERIES OF THE FLORIDA GULF COAST AND KEYS. *Mar. Fish. Rev.* 43(8):12-20. Aug. 1981. SFA 27(1)
[NMFS, 75 Virginia Beach Dr., Miami, FL 33149]

82-000455 Juneau, C. L., Jr. and J. F. Pollard. A SURVEY OF THE RECREATIONAL SHRIMP AND FINFISH HARVESTS OF THE VERMILION BAY AREA AND THEIR IMPACT ON COMMERICIAL FISHERY RESOURCES. *La. Dep. Wildl. Fish. Tech. Bull.* No. 33. vii + 40p. July 1981. SFA 27(1)

82-000456 Manooch, C. S. III; L. E. Abbas and J. L. Ross. A BIOLOGICAL AND ECONOMIC ANALYSIS OF THE NORTH CAROLINA CHARTER BOAT FISHERY. *Mar. Fish. Rev.* 43(8):1-11. Aug. 1981. SFA 27(1)
[NMFS, Beaufort, NC 28516]

82-000457 Taylor, J. L. and S. D. Reiling. A COMPARISON OF MAINE OPEN WATER AND ICE FISHING ACTIVITIES AND PARTICIPANTS. *Univ. Me. Life Sci. Agric. Exp. Stn. Bull.* 778. 32p. Sept. 1981. SFA 27(1)
[Dep. Zool., Univ. Me., Orono]

REGULATIONS

82-000458 Holliday, M. C. COMPARATIVE IMPACTS OF FOUR LIMITED ENTRY FISHERY MANAGEMENT POLICIES PROPOSED FOR THE NEW ENGLAND GROUNDFISHERY. *Ph.D. dissertation, Univ. Del.* 388p. 1981. From Diss. Abstr. Int. B Sci.

REGULATIONS (CONTINUED)

82-000458 CONTINUED Eng. 42(5):1717. Nov. 1981. SFA 27(1)
Four limited entry management policies are examined for use in the New England groundfishery: (1) a fisherman's quota plan, (2) an effort share plan, (3) a license plan, and (4) a landing tax plan. The impacts of the plans on the fishery are predicted and compared on the basis of management operation, socioeconomic effects, biological effectiveness and economic efficiency. Overall, the fisherman's quota plan is superior for the commercial sector in comparison to the other plans and the current management policy. This choice is based on the overall superior ranking of the plan in 13 criteria for judging a management plan, its relative ability to achieve management objectives set by the New England Fishery Management Council, and its potential for increasing economic efficiency in the fishery. In the recreational groundfishing sector bag limits and mimimum possession size are identified as more suitable management measures than any of the proposed limited entry policies.

FISH CONTROL AND REMOVAL

82-000459 Hanson, L. H. STERILIZATION OF SEA LAMPREYS (*PETROMYZON MARINUS*) BY IMMERSION IN AN AQUEOUS SOLUTION OF BISAZIR. *Can. J. Fish. Aquatic Sci.* 38(10):1285-1289. Oct. 1981. In English with French summ. SFA 27(1)
[U.S. FWS, Hammond Bay Biol. Stn., Millersburg, MI 49759]

MARKING AND TAGGING

82-000460 Black, G. A. METAZOAN PARASITES AS INDICATORS OF MOVEMENTS OF ANADROMOUS BROOK CHARR (*SALVELINUS FONTINALIS*) TO SEA. *Can. J. Zool.* 59(10):1892-1896. Oct. 1981. In English with French summ. SFA 27(1)
[Dep. Zool., Coll. Biol. Sci., Univ. Guelph, Guelph, ON N1G 2W1, Canada]

82-000461 Byars, J. TAGGING MORTALITY AND TAG SHEDDING OF JUVENILE GULF MENHADEN, *BREVOORTIA PATRONUS*. *La. Dep. Wildl. Fish. Tech. Bull.* No. 32. ix + 11p. July 1981. SFA 27(1)

STOCKING AND INTRODUCTIONS

82-000462 Khakimullin, A. A. MORPHOPHYSIOLOGICAL EVALUATION OF THE HATCHERY REARED YOUNG OF THE SIBERIAN STURGEON, *ACIPENSER BAERI*. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(5):99-107. 1980. SFA 27(1)
[SibrybNIIproyekt, Tyumen, USSR] The young of the Siberian sturgeon, *Acipenser baeri*, reared under different conditions, are dissimilar in several characters. Underyearlings from ponds with vegetation are considerably larger, the relative weight of their internal organs greater and their hematological indices higher. These young are represented by the most resistant specimens which have survived under unfavorable conditions. The length increase of sturgeon underyearlings outstrips their weight increase, but on the whole their growth is approximately isometric. The most rapid increase in hemoglobin concentration occurs before the young have reached a weight of around 2g, after which the rate at which hemoglobin is accumulated decreases rapidly. The increase in the number of erythrocytes proceeds more evenly. The increase in hemoglobin concentration and in the number of

STOCKING AND INTRODUCTIONS (CONTINUED)

82-000462 CONTINUED erythrocytes with the increase in body weight, and the increase in hemoglobin concentration with he increase in the number of erythrocytes are described by a equation of the type y=a+blnx.

82-000463 Kircheis, F. W. and J. G. Stanley. THEORY AND PRACTICE OF FORAGE-FISH MANAGEMENT IN NEW ENGLAND. *Trans. Am. Fish. Soc.* 110(6):729-737. Nov. 1981. SFA 27(1)
[Me. Dep. Inland Fish. Wildl., 34 Idaho Ave., Bangor 04401]

82-000464 Li, H. W. and P. B. Moyle. ECOLOGICAL ANALYSIS OF SPECIES INTRODUCTIONS INTO AQUATIC SYSTEMS. *Trans. Am. Fish. Soc.* 110(6):772-782. Nov. 1981. SFA 27(1)
[Oreg. Coop. Fish. Res. Unit., Oreg. State Univ., Corvallis 97331]

82-000465 Mathias, J. A. and M. Papst. GROWTH, SURVIVAL AND DISTRIBUTION OF *GAMMARUS LACTUSTRIS* (CRUSTACEA - AMPHIPODA) STOCKED INTO PONDS. *Can. Tech. Rep. Fish. Aquatic Sci.* No. 989. iv + 11p. Aug. 1981. SFA 27(1)
[West. Reg., Dep. Fish. Oceans, Winnipeg, MB R3T 2N6, Canada] *Gammarus lacustris* was stocked at a density of 411 animals m^{-2} into a 1.8 ha pond with no fish predators. A high mortality rate of 8% da^{-1} was attributed to invertebrate predation. Growth rates and brood sizes of the stocked amphipods were similar to those of the parent population. Sex ratio, body size and reproductive stage of adult *G. lacustris* were biased by the harvest method and therefore differed between the stocked and parent populations. Stocking of *G. lacustris* into ponds as a food organism for fish is feasible if invertebrate predators can be controlled.

82-000466 Ney, J. J. EVOLUTION OF FORAGE-FISH MANAGEMENT IN LAKES AND RESERVOIRS. *Trans. Am. Fish. Soc.* 110(6):725-728. Nov. 1981. SFA 27(1)
[Dep. Fish. Wildl. Sci., VPI&SU, Blacksburg, VA 24061]

82-000467 Noble, R. L. MANAGEMENT OF FORAGE FISHES IN IMPOUNDMENTS OF THE SOUTHERN UNITED STATES. *Trans. Am. Fish. Soc.* 110(6):738-750. Nov. 1981. SFA 27(1)
[Dep. Wildl. Fish. Sci., Tex. A&M Univ., College Station 77843]

82-000468 Snetkov, M. A. and Yu. S. Reshetnikov. POSSIBLE USE OF A MODIFIED BEVERTON-HOLT RECRUITMENT MODEL TO ESTIMATE THE OPTIMUM STOCKING DENSITY OF LARVAL COREGONIDS. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):143-146. 1980. SFA 27(1)
[IEMEZh, Moscow, USSR]

82-000469 Wydoski, R. S. and D. H. Bennett. FORAGE SPECIES IN LAKES AND RESERVOIRS OF THE WESTERN UNITED STATES. *Trans. Am. Fish. Soc.* 110(6):764-771. Nov. 1981. SFA 27(1)
[U.S. FWS, Natl. Fish. Cent., Kearneysville, WV 25430]

FISHING GEAR AND TECHNIQUES

82-000470 Lalancette, L.-M. ELLIPSOIDAL TRAP FOR FRESHWATER MINNOWS AND SUCKERS. *Prog. Fish.-Cult.* 43(4):193-194. Oct. 1981. SFA 27(1)
[Dep. Pure Sci., Univ. Quebec, Chicoutimi, PQ G7H 2B1, Canada]

FISHING GEAR AND TECHNIQUES (CONTINUED)

82-000471 Levi, E. J. DESIGN AND OPERATION OF A SMALL TWO-BOAT PURSE SEINE. *Estuaries* 4(4):385-387. Dec. 1981. SFA 27(1)
[NMFS, Southeast Fish. Cent., Beaufort Lab. Field Stn., Gulf Breeze, FL 32561] A small purse seine, 250 ft. long and 23 ft. deep, and two 14 ft. purse boats to fish it in shallow estuaries for menhaden (*Brevoortia*) are described. The seine is made of No. 6 nylon in the two wings and heavier No. 15 nylon in the center bunt. Mesh is 1 3/8 in. bar. Purse boats have a 7 ft. beam and 2 ft. of freeboard, and are built of 1/4 in. marine plywood and seasoned oak ribs. A 40 hp outboard motor mounted in a center well powers each boat. Boats and seine are portable (on trailers) and can be used any place where launching sites are available. Over 40,000 menhaden were caught and marked with internal ferro-magnetic tags over a 3-year period. Boats and seine also could be used to capture other schooling species.

82-000472 Olson, D. A. and J. A. LaPlace. DEMONSTRATION OF ADVANCES IN VIRGIN ISLANDS SMALL BOAT FISHING TECHNIQUES. *Mar. Fish. Rev.* 43(11):11-15. Nov. 1981. SFA 27(1)
[Dep. Conserv. Cult. Off., P.O. Box 2755, Charlotte Amalie, St. Thomas, Virgin Islands]

82-000473 Regis, J.; E. Pattee and J. D. Lebreton. A NEW METHOD FOR EVALUATING THE EFFICIENCY OF ELECTRIC FISHING. *Arch. Hydrobiol.* 93(1):68-82. 1981. SFA 27(1)
[Dep. Biol. Anim. Ecol., Univ. Claude Bernard-Lyon I, 43 bd du 11 Novembre 1918, F-69622 Villeurbanne Cedex, France]

82-000474 Seki, H.; A. Hamada; T. Iwami and R. J. LeBrasseur. HOBIKIAMI SAIL TRAWLING IN JAPAN. *Fisheries (Bull. Am. Fish. Soc.)* 6(6):2-15. Nov.-Dec. 1981. SFA 27(1)
[Dep. Biol. Sci., Univ. Tsukuba, Sakuramura, Ibaraki, Japan]

82-000475 Stauffer, T. M. COLLECTING GEAR FOR LAKE TROUT EGGS AND FRY. *Prog. Fish.-Cult.* 43(4):186-193. Oct. 1981. SFA 27(1)
[Marquette Fish. Res. Stn., Mich. Dep. Nat. Resour., 484 Cherry Creek Rd., Marquette 49855]

FERTILIZATION OF SOIL AND WATER

82-000476 Simpson, K.; L. Hop Woo and I. Miki. FISH SURVEYS OF 15 SOCKEYE SALMON (*ONCORHYNCHUS NERKA*) NURSERY LAKES IN BRITISH COLUMBIA. *Can. Tech. Rep. Fish Aquatic Sci.* no. 1022. v + 87p. July 1981. In English with French summ. SFA 27(1)
[Dep. Fish. Oceans, Pac. Biol. Stn., Nanaimo, BC V9R 5K6, Canada]

FISHWAYS, FISH PASSAGE THROUGH DAMS, ETC.

82-000477 Smith, D.; I. Kornfield and B. Goodwin. REMOTELY OPERATED TRAP FOR CAPTURE OF TERRITORIAL FISHES. *Prog. Fish.-Cult.* 43(4):208-209. Oct. 1981. SFA 27(1)
[Migratory Fish Res. Inst., Univ. Me., Orono 94469]

FISHWAYS, FISH PASSAGE THROUGH DAMS, ETC. (CONTINUED)

82-000478 Turnpenny, A. W. H. AN ANALYSIS OF MESH SIZES REQUIRED FOR SCREENING FISHES AT WATER INTAKES. *Estuaries* 4(4):363-368. Dec. 1981. SFA 27(1)
[Cent. Elect. Res. Lab., Mar. Biol. Lab., Fawley, Southampton, Hampshire SO4 1TW, England]

MATHEMATICS, STATISTICAL METHODS, AND MODELING

82-000479 Agnello, R. J. and L. G. Anderson. PRODUCTION RESPONSES FOR MULTI-SPECIES FISHERIES. *Can. J. Fish. Aquatic Sci.* 38(11):1393-1404. Nov. 1981. SFA 27(1)
[Dep. Econ. Mar. Sci., Univ. Del., Newark 19711]

82-000480 Otero, H. O. and D. R. Hernandez. DISEÑO DE UN MUESTREO ESTRATIFICADO PARA EL MONITOREO DEL STOCK DE MERLUZA COMÚN (*MERLUCCIUS HUBBSI*). [DESIGN OF A STRATIFIED RANDOM SAMPLING TO MONITOR THE STOCK OF COMMON HAKE (*MERLUCCIUS HUBBSI*).] *Argentina Inst. Nac. Invest. Desar Pesq. Contrib.* no. 361. 10p. July 1981. In Spanish with English summ. SFA 27(1)
[Nac. Invest. Desar. Pesq., Casilla de Correo 175, 7600 Mar del Plata, Argentina]

82-000481 Stocker, M. and R. Hilborn. SHORT-TERM FORECASTING IN MARINE FISH STOCKS. *Can. J. Fish. Aquatic Sci.* 38(10):1247-1254. Oct. 1981. In English with French summ. SFA 27(1)
[Dep. Fish. Oceans, Pac. Biol. Stn., Nanaimo, BC V9R 5K6, Canada]

82-000482 Wild, A. AN INVESTIGATION OF FISHERIES YIELD EQUATIONS WITH PARTICULAR REFERENCE TO ANNUAL STATE MODELS AND SEASONAL PULSE FISHING. *Ph.D. dissertation, Univ. British Columbia* 1981. From Diss. Abstr. Int. B Sci. Eng. 42(6):2264. Dec. 1981. SFA 27(1)

LAKE MANAGEMENT AND RESEARCH

82-000483 Gunn, J. M. and W. Keller. EMERGENCE AND SURVIVAL OF LAKE TROUT (*SALVELINUS NAMAYCUSH*) AND BROOK TROUT (*S. FONTINALIS*) FROM ARTIFICAL SUBSTRATES IN AN ACID LAKE. *Ontario Fish. Tech. Rep. Ser.* No. 1. iii + 9p. 1981. SFA 27(1)
[Ontario Minist. Nat. Resour., Sudbury, ON P3A 4S2, Canada] Eyed eggs of lake trout (*Salvelinus namaycush*) and brook trout (*S. fontinalis*) were incubated overwinter in crushed limestone and mixed noncalcareous gravel substrates in the acidic waters (pH 5.2) of George Lake. Alevin emergence for both species (33.6-73.0%) was generally good for limestone substrates (interstitial water pH > 6) and almost nonexistent (0.1-1.3%) from mixed gravel substrates (interstitial water pH 5.5). Survival of alevins of both species hatched in limestone was high during 7-d holding periods in both the acidic lake (70.0-100.0%) and at a control site in the near-neutral waters of Killarney Bay (89.5-100). High alevin mortality observed after 30 d of an extended (41-d) exposure in George Lake appeared related to feeding and containment problems rather than pH toxicity. The substantial alevin emergence from limestone and the high survival during 7-d and 30-d holding periods indicate that small scale limestone applications to

LAKE MANAGEMENT AND RESEARCH (CONTINUED)

82-000483 CONTINUED provide spawning substrates would enhance salmonid recruitment in some acidic lakes.

82-000484 Thorne, R. E. and G. L. Thomas. HYDROACOUSTIC SURVEYS OF FISH ABUNDANCE AND DISTRIBUTION IN TWIN LAKES, COLORADO. *U.S. Dep. Interior Water Power Resour. Serv.* REC-ERC-81-4. v + 14p. Apr. 1981. SFA 27(1)
[Fish. Res. Inst., Coll. Fish., Univ. Wash., Seattle] Hydroacoustic surveys were conducted on Twin Lakes, Colorado, during September 1980 in order to measure the size and distribution of the resident fish population. Two distinct size groups of fish were observed: large fish below the thermocline (about 12 m) and small fish in the epilimnion. Net samples indicated that the large fish were predominately lake trout. Their estimated population size was 14,600, with 95% confidence limits of 4,100 to 25,000. The relatively large confidence intervals were the result of the relatively low fish density and its contagious distribution. The small fish were not identified, but may have been juvenile lake trout. Population estimates of this group were not made because of extreme patchiness and undersampling by the survey procedures, which focused on the larger fish.

RIVER AND STREAM MANAGEMENT AND RESEARCH

82-000485 Mih, W. C. and G. C. Bailey. THE DEVELOPMENT OF A MACHINE FOR THE RESTORATION OF STREAM GRAVEL FOR SPAWNING AND REARING OF SALMON. *Fisheries (Bull. Am. Fish. Soc.)* 6(6):16-20. Nov.-Dec. 1981. SFA 27(1)
[Albrook Hydraul. Lab., Dep. Civ. Environ. Eng., Univ. Wash., Pullman]

82-000486 Wahle, R. J. and E. Chaney. ESTABLISHMENT OF NONINDIGENOUS RUNS OF SPRING CHINOOK SALMON, *ONCORHYNCHUS TSHAWYTSCHA*, IN THE WIND RIVER DRAINAGE OF THE COLUMBIA RIVER, 1955-63. *NOAA Fish. Bull.* 79(3):507-516. July 1981. SFA 27(1)
[NMFS, 811 NE Oregon St., P.O. Box 4332, Portland, OR 97209]

82-000487 Winterbourn, M. J.; J. S. Rounick and B. Cowie. ARE NEW ZEALAND STREAM ECOSYSTEMS REALLY DIFFERENT? *N.Z. J. Mar. Freshwater Res.* 15(3):321-328. 1981. SFA 27(1)
[Dep. Zool., Univ. Canterbury, Christchurch 1, New Zealand]

FARM POND AND SMALL IMPOUNDMENT MANAGEMENT AND RESEARCH

82-000488 Lewis, G. E. CHARACTERISTICS OF ALEWIVES IN A SMALL WEST VIRGINIA IMPOUNDMENT. *Prog. Fish.-Cult.* 43(4):224. Oct. 1981. SFA 27(1)
[W. Va. Dep. Nat. Resour., Drawer C, Romney 26757]

LARGE IMPOUNDMENT MANAGEMENT AND RESEARCH

82-000489 Lusk, S. DEVELOPMENT OF THE FISH POPULATION IN THE MUŠOV RESERVOIR IN THE FIRST YEAR AFTER FILLING. *Folia Zool.* 30(3):249-261. 1981. In English with Russian summ. SFA 27(1)
[Inst. Vert. Zool., Czech. Acad. Sci., Brno, Czechoslovakia]

LARGE IMPOUNDMENT MANAGEMENT AND RESEARCH (CONTINUED)

82-000490 Quiros, R. EVALUACION DEL RENDIMIENTO PESQUERO POTENCIAL DE EMBALSE DE SALTO GRANDE. [ESTIMATE OF FISHERY YIELD POTENTIAL FOR THE SALTO GRANDE RESERVOIR (31°S - 58°W).] *Argentina Inst. Nac. Invest. Desar. Pesq. Contrib.* No. 395. 18p. 1980. In Spanish with English summ. SFA 27(1)
[Nac. Invest. Desar. Pesq., Casilla de Correo 175, 7600 Mar del Plata, Argentina]

82-000491 Yahnke, J. W. WATER QUALITY OF THE PROPOSED NORDEN RESERVOIR, NEBRASKA, AND ITS IMPLICATIONS FOR FISHERY MANAGEMENT. *U.S. Dep. Interior Bur. Reclam.* REC-ERC-81-8. v + 50p. May 1981. SFA 27(1)
[U.S. Dep. Interior, Bur. Reclam., Reg. Environ. Aff. Off., Lower Mo. Reg., Denver, CO]

ESTUARY MANAGEMENT AND RESEARCH

82-000492 Benson, N. G. THE FRESHWATER-INFLOW-TO-ESTUARIES ISSUE. *Fisheries (Bull. Am. Fish. Soc.)* 6(5):8-10. Sept.-Oct. 1981. SFA 27(1)
[1000 Rue Cortou, Slidell, LA 70458]

82-000493 Leaney, A. J. and S. Morris. THE BELLA COOLA RIVER ESTUARY STATUS OF ENVIRONMENTAL KNOWLEDGE TO 1981. REPORT OF THE ESTUARY WORKING GROUP FISHERIES AND OCEANS/ENVIRONMENT JOINT CO-ORDINATING COMMITTEE ON ENVIRONMENTAL AFFAIRS PACIFIC AND YUKON REGION. *Can. Dep. Fish. Oceans Spec. Estuary Ser.* No. 10. xxxiv + 260p. 31 Mar. 1981. SFA 27(1)
[Dep. Fish. Oceans, 4160 Marine Dr., West Vancouver, BC V7V 1N6, Canada]

MARINE MANAGEMENT AND RESEARCH

82-000494 Matsumoto, W. M.; T. K. Kazama and D. C. Aasted. ANCHORED FISH AGGREGATING DEVICES IN HAWAIIAN WATERS. *Mar. Fish. Rev.* 43(9):1-13. Sept. 1981. SFA 27(1)
[NMFS, P.O. Box 3830, Honolulu, HI 96812]

82-000495 Otero, H.; J. P. Comas and R. Perrotta. "AREAS OPTIMAS DE PESCA DE ALTURA EN EL MAR ARGENTINO. [OPTIMUM OFF-SHORE FISHING AREAS IN THE ARGENTINE SEA.] *Argentina Inst. Nac. Invest. Desar. Pesq. Contrib.* No. 398. 9p. July 1981. In Spanish with English summ. SFA 27(1)
[Nac. Invest. Desar. Pesq., Casilla de Correo 175, 7600 Mar del Plata, Argentina]

UTILIZATION OF FISHERY PRODUCTS

82-000496 Miller, J. S.; J. R. Conner and J. E. Waldrop. SURVEY OF COMMERCIAL CATFISH PROCESSORS--STRUCTURAL AND OPERATIONAL CHARACTERISTICS AND PROCUREMENT AND MARKETING PRACTICES. *Miss. State Univ. Dep. Agric. Econ. AEC Res. Rep.* No. 130. vi + 18p. Oct. 1981. SFA 27(1)
[Miss. Agric. For. Exp. Stn., Mississippi State 39762]

UTILIZATION OF FISHERY PRODUCTS (CONTINUED)

82-000497 Tsepkin, Ye. A. THE ORIGIN AND DEVELOPMENT OF FISHING IN CONTINENTAL WATERS IN THE ASIAN REGIONS OF THE USSR. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 20(6):30-36. 1980. SFA 27(1)
[Dep. Ichthyol., Moscow Univ., USSR]

MISC. TECHNIQUES AND EQUIPMENT

82-000498 Iida, K. and T. Suzuki. [AN ACOUSTIC SURVEY FOR THE ESTIMATION OF FISH STOCKS AND BEHAVIOR OF KOKANEE (*ONCORHYNCHUS NERKA F. ADONIS*) IN LAKE KUTTARA.] *Bull. Fac. Fish. Hokkaido Univ.* 32(3):272-280. Sept. 1981. In Japanese with English summ. SFA 27(1)
[Lab. Instrument Eng. Fish., Fac. Fish., Hokkaido Univ., Hakodate 041, Japan]

82-000499 Lasker, R.; J. Peláez and R. M. Laurs. THE USE OF SATELLITE INFRARED IMAGERY FOR DESCRIBING OCEAN PROCESSES IN RELATION TO SPAWNING OF THE NORTHERN ANCHOVY (*ENGRAULIS MORDAX*). *Remote Sensing Environ.* 11(6):439-453. Dec. 1981. SFA 27(1)
[NMFS, Southwest Fish. Cent., La Jolla, CA 92038] Using satellite infrared thermal imagery in conjunction with extensive sampling for anchovy eggs and adults during March and April 1980, we were able to confirm that large areas of the coastal ocean off California were avoided by anchovies during the peak of spawning due to entrainment into the California Current of ≤ 14°C water that upwelled north of Point Conception. Upwelling began coincident with the onset of winds from the north and proceeded in pulses separated by a few days. Plumes of upwelled water appeared to be advected southward in ladder-like rows by the California Current. A saline 50+-m-deep warm water pool, 40 km off Ensenada, Baja California, Mexico also was avoided by anchovies. The appearance of an inshore 16°C refuge and an extensive 220-km warm-water "wake" associated with Santa Catalina Island also were observed. Each of these oceanographic features was confirmed by ship observations.

82-000500 Miller, D. W. ALTERNATIVE METHOD OF CONVERTING CELSIUS AND FAHRENHEIT TEMPERATURES. *Prog. Fish.-Cult.* 43(4):204. Oct. 1981. SFA 27(1)
[Valley City Natl. Fish Hatchery, R.R. 1, Valley City, ND 58072]

82-000501 Rinne, J. N. and M. D. Jakle. THE PHOTARIUM: A DEVICE FOR TAKING NATURAL PHOTOGRAPHS OF LIVE FISH. *Prog. Fish.-Cult.* 43(4):201-204. Oct. 1981. SFA 27(1)
[U.S. For. Serv., Rocky Mtn. For. Range Exp. Stn. For. Sci. Lab., Ariz. State Univ., Tempe 85281]

REVIEWS, BIBLIOGRAPHIES, ETC.

82-000502 Marshall, K. E. and M. Layton. AN INDEX TO THE PUBLICATIONS OF THE STAFF OF THE WESTERN REGION, DEPARTMENT OF FISHERIES AND OCEANS, 1978-79. *Can. Tech. Rep. Fish Aquatic. Sci.* No. 992. iv + 56p. Aug. 1981. In English with French summ. SFA 27(1)
[Dep. Fish. Oceans, Winnipeg, MB R3T 2N6, Canada]

Aasted, D. C.
82-000494
Abbas, L. E.
82-000456
Adamek, Z.
82-000265
Addison, R. F.
82-000428
Agnello, R. J.
82-000479
Aimar, C.
82-000137
Al-Habbib, O. A. M.
82-000082
Albrecht, H.
82-000174
Albright, J. T.
82-000132
Alderman, D. J.
82-000364
Alevizon, W. S.
82-000178
Allen, G. H.
82-000006
Allen, W. V.
82-000006
Alvarez-Lajonchere, L.
82-000237
Amidan, G.
82-000036
Amirkhanov, G. A.
82-000083
Anderson, L. G.
82-000479
Anderson, M.
82-000378
82-000379
Anderson, W. D., Jr.
82-000332
Aoki, M.
82-000185
Appy, R. G.
82-000380
Arieli, Y.
82-000036
Arillo, A.
82-000421
Arnold, C. R.
82-000054
82-000330
Asbury, K.
82-000309
Austin, B.
82-000364
Avault, J. W., Jr.
82-000043
Ayles, G. B.
82-000019
82-000020
Azuma, M.
82-000207
Bailey, G. C.
82-000485
Bakanov, A. I.
82-000279
Balushkin, A. V.
82-000337
Banarescu, P. M.
82-000349
Banerji, S. R.
82-000238
Barton, B. A.
82-000422
Bartoo, R.
82-000328
Barus, V.
82-000084
Bateman, D.
82-000320
Bath, H.
82-000333
82-000334
Bauer, J. A., Jr.
82-000239
Bauer, S. E.
82-000239
Beamish, F. W. H.
82-000412
Beardsley, G. L.
82-000216
Beck, I.-M.
82-000305
Beitinger, T. L.
82-000177
82-000411
Bekker, V. E.
82-000335
Benditt, E. P.
82-000427
Bennett, D. H.
82-000469
Benson, N. G.
82-000492
Berry, C. R., Jr.
82-000312
Berti, R.
82-000181
Beverley-Burton, M.
82-000381
Bhaskar, M.
82-000431
Bielek, E.
82-000085
Billard, R.
82-000086
Bird, D. J.
82-000087
Birnie, S. E.
82-000392
Biswas, N.
82-000136
Blaber, S. J. M.
82-000044
Black, G. A.
82-000460
Blake, R. L.
82-000003

Blanc, J. M.
82-000158
Blaxter, J. H. S.
82-000175
82-000176
Blouw, D. M.
82-000045
Bond, J.
82-000427
Borgstrom, R.
82-000270
Borodulina, O. D.
82-000335
Bosch, H.
82-000108
Braekkan, O. R.
82-000145
Braid, M. R.
82-000013
Branstetter, S.
82-000301
Brege, D. A.
82-000285
Brewer, K.
82-000313
Brooks, D. R.
82-000386
Browder, J. A.
82-000454
Brown, J. A.
82-000336
Brusher, H. A.
82-000099
Brusven, M. A.
82-000266
Buckley, J. T.
82-000090
Burns, J. R.
82-000051
Burt, M. D. B.
82-000382
Burton, D. T.
82-000436
Buschbom, R. L.
82-000159
Butler, J. L.
82-000068
Butskaya, N. A.
82-000088
Butterworth, B. C.
82-000406
Buttner, J. K.
82-000015
Byars, J.
82-000461
Calhoun, S. W.
82-000177
Campagna, C. G.
82-000089
Campbell, J.
82-000367
Campbell, R. A.
82-000387
Cardeilhac, P. T.
82-000420
Cardenette, G.
82-000131
Carlberg, G. E.
82-000433
Carling, P. A.
82-000256
Carmack, E. C.
82-000040
Carr, W. E.
82-000420
Carroll, J.
82-000451
Carter, J. S.
82-000377
Casterlin, M. E.
82-000196
Castledine, A. J.
82-000090
Cech, J. J., Jr.
82-000089
Chan, G.
82-000373
Chandra, K.
82-000022
Chaney, E.
82-000264
82-000486
Chang, K.-Y.
82-000442
Chapman, D. J.
82-000396
82-000404
82-000415
82-000416
Chase, R.
82-000093
Chebanov, N. A.
82-000240
Chen, C.
82-000241
Chereshnev, I. A.
82-000337
Chernoff, B.
82-000338
Chien, Y.-H.
82-000043
Chittenden, M. E., Jr.
82-000148
Cho, C. Y.
82-000408
Christie, A. E.
82-000393
Chubb, C. F.
82-000286
Cianfanelli, A.
82-000181
Ciechomski, J. D. de
82-000242
82-000243
Cipriano, R. C.
82-000365

Clady, M. D.
82-000267
Clark, M. R.
82-000302
Clarke, A.
82-000256
Cloutman, D. G.
82-000374
Coad, B. W.
82-000339
Cohen, D. M.
82-000303
Cole, W. C.
82-000091
Coleman, F.
82-000092
Colgan, P. W.
82-000336
Collins, J. P.
82-000327
Colton, D. E.
82-000178
Comas, J. P.
82-000495
Cone, D. K.
82-000382
82-000383
Conner, J. R.
82-000496
Conroy, D. A.
82-000362
Cooper, M.
82-000227
Cooper, M. J.
82-000221
Cope, O. B.
82-000448
Corazza, L.
82-000047
Cottle, J.
82-000385
Cowie, B.
82-000487
Coyer, J. A.
82-000180
Crane, J. M., Jr.
82-000208
Crateau, E. J.
82-000209
Cresswell, G. R.
82-000316
Crowder, L. B.
82-000282
Cyrus, D. P.
82-000044
Dalela, R. C.
82-000418
Daley, R. J.
82-000040
Damianakis, H.
82-000170
Darcy, G. H.
82-000268
Dauble, D. D.
82-000159
Davis, J. C.
82-000454
Davis, R. E.
82-000093
Davison, W.
82-000046
Day, M. H.
82-000179
De Martini, E. E.
82-000180
82-000244
Dean, J. M.
82-000253
Deelder, C. L.
82-000287
Demina, A. G.
82-000288
Denton, E. J.
82-000175
Detollenaere, A.
82-000407
DeWitt, H. H.
82-000304
Dill, L. M.
82-000269
Dindo, J. J.
82-000123
Dixon, D. G.
82-000423
Djabali, M.
82-000094
Dominguez, R.
82-000293
Donaldson, E. M.
82-000007
82-000008
82-000009
82-000429
Dooley, J. K.
82-000340
Dorofeyeva, Ye. A.
82-000341
Doucette, A. J., Jr.
82-000162
Douglas, W. A.
82-000230
Dowling, R. M.
82-000320
Drangsholt, H.
82-000433
Druzhinin, A. D.
82-000210
Dunn, J. F.
82-000046
Dye, H. M.
82-000007
82-000008
82-000009
82-000429
Eales, J. G.
82-000095

Economidis, P. S.
82-000170
Edwards, T. J.
82-000211
82-000399
Edwards, T. W.
82-000096
Egusa, S.
82-000388
Ehrlich, M. D.
82-000242
82-000243
Eie, J. A.
82-000270
Eley, R.
82-000451
Elger, M.
82-000097
Elliott, S. T.
82-000328
Ellis, M. J.
82-000098
Elovenko, V. N.
82-000342
Elston, R.
82-000047
Engelman, R. W.
82-000384
Ercolini, A.
82-000181
Eriksson, L.-O.
82-000160
Esquerda, J. E.
82-000149
Ezeasor, D. N.
82-000048
Ezzi, I. A.
82-000212
Fable, W. A., Jr.
82-000054
82-000099
Fadeyeva, T. A.
82-000245
Farlinger, S. P.
82-000318
Farwell, C. J.
82-000038
Fausch, K. D.
82-000182
Favaretto, A. L. V.
82-000100
Fechhelm, R. G.
82-000107
Ferguson, M. M.
82-000161
Ferraris, C. J., Jr.
82-000317
Ferri, S.
82-000049
Finnegan, J., Jr.
82-000099
Finnell, L. M.
82-000452
Finucane, J. H.
82-000123
Fischer, J. M.
82-000394
Fisher, J. W.
82-000426
Fitzsimons, J. M.
82-000162
Flanagan, C. A.
82-000183
Fletcher, G. L.
82-000106
Flores, J. A.
82-000051
Fouche, L.
82-000016
Fountain, R. K.
82-000244
Francis, M. P.
82-000050
82-000246
Frank, K. T.
82-000329
Frankel, J. S.
82-000101
Fraser, A. H. G.
82-000269
Fritts, T. H.
82-000310
Fritzsche, R. A.
82-000343
Fuller, R. L.
82-000399
Gafford, G. M.
82-000014
Gagliardi, J.
82-000041
Gajdusek, J.
82-000289
Galassi, S.
82-000395
Gandolfi, G.
82-000395
Garcia, M.
82-000131
Garton, J. S.
82-000211
Gascon, D.
82-000222
Genin, M.
82-000407
Geraudie, J.
82-000424
Gerking, S. D.
82-000233
Gery, J.
82-000360
Ghittino, P.
82-000002
Gibson, D. I.
82-000385
Gibson, R. N.
82-000212

Gilmore, R. G.
82-000257
82-000443
Giovanardi, O.
82-000023
Girard, J.-P.
82-000094
Girsa, I. I.
82-000102
Gjosaeter, J.
82-000223
82-000305
Godbout, R.
82-000330
Goldberg, S. R.
82-000247
Goldspink, C. R.
82-000290
Goncharov, B. F.
82-000103
Goodwin, B.
82-000477
Gordon, M. S.
82-000396
82-000404
82-000415
82-000416
Gore, J. A.
82-000453
Govindappa, S.
82-000431
Grabner, M.
82-000028
Grant, C. J.
82-000286
Grant, W. S.
82-000163
82-000163
Gray, C. B. J.
82-000040
Gray, J. A. B.
82-000175
Grecay, P. A.
82-000304
Gress, F.
82-000232
Grier, H. J.
82-000051
Griffin, B. R.
82-000365
Grimes, P. J.
82-000052
Griswold, C. A.
82-000397
Guerra Padron, F.
82-000084
Gunkel, G.
82-000306
Gunn, J. M.
82-000483
Guppy, M.
82-000046
Hacunda, J. S.
82-000304
Hagen, D. W.
82-000045
Haines, T. A.
82-000398
Hamada, A.
82-000474
Hamilton, S. J.
82-000053
82-000104
Hamman, R. L.
82-000017
82-000039
Hamme, R. E.
82-000377
Hampl, A.
82-000056
Hansen, F.
82-000011
Hansen, H. O.
82-000105
Hanson, L. H.
82-000459
Harbison, G. R.
82-000271
Hardy, G. S.
82-000307
Harrell, R. D.
82-000374
82-000399
Harvey, H. H.
82-000308
82-000413
Hastings, P. A.
82-000443
Hatakeyama, S.
82-000419
Hayama, K.
82-000205
Heitmuller, P. T.
82-000425
Helfman, G. S.
82-000184
Helfrich, H.
82-000422
Hendrix, M. A.
82-000031
Hentschel, H.
82-000097
Hernandez, D. R.
82-000480
Hew, C. L.
82-000106
Hibiya, T.
82-000138
Higler, L. W. G.
82-000400
Hilborn, R.
82-000481
Hildebrand, A. C.
82-000359
Hill, L. G.
82-000309
Hilton, J. W.
82-000423

Hioki, S.
82-000076
82-000219
Hirose, K.
82-000153
Hochachka, P. W.
82-000046
Hocutt, C. H.
82-000401
Hodges, D. J.
82-000392
Hodson, R. G.
82-000107
Hoese, D. F.
82-000317
Hoffman, S. G.
82-000198
Hoffman, W.
82-000310
Hogendoorn, H.
82-000108
Holliday, M. C.
82-000458
Hollister, T. A.
82-000425
Holt, J.
82-000054
82-000330
Hop Woo, L.
82-000476
Horikawa, M.
82-000283
Hoss, D. E.
82-000176
Hotopp, W.
82-000109
Houston, A. H.
82-000114
Howell, J.
82-000327
Howes, G.
82-000344
Hughes, S. G.
82-000029
Huish, M. T.
82-000014
Humphries, J. M., Jr.
82-000345
Hunt, T. P.
82-000426
Hunter, G. A.
82-000007
82-000008
82-000009
Hunter, J. R.
82-000217
Iida, K.
82-000498
Ikeda, S.
82-000205
Inada, Y.
82-000369
82-000372
Inamura, O.
82-000283
Inoue, M.
82-000185
International Council for the Exploratio
of the Sea
82-000402
Ishihara, S.
82-000366
Ito, S.
82-000055
Iwamatsu, T.
82-000135
Iwami, T.
82-000474
Jagoe, C. J.
82-000003
Jain, M.
82-000418
Jakle, M. D.
82-000501
Jankowsky, H. D.
82-000109
Janssen, J.
82-000271
Jasper, S.
82-000040
Jennison, B. L.
82-000443
Jensen, A. L.
82-000224
Jirasek, J.
82-000056
Johansson, H.
82-000160
Johnson, A. G.
82-000054
Johnson, K. L.
82-000406
Johnston, C. E.
82-000110
Johnston, I. A.
82-000130
Jones, J. R.
82-000053
82-000104
Joshi, S. B.
82-000106
Judy, R. D., Jr.
82-000453
Juneau, C. L., Jr.
82-000455
Jurss, K.
82-000030
Kabata, Z.
82-000375
Kagawa, H.
82-000111
Karakousis, J.
82-000170
Karaman, I. I.
82-000311
Karpov, A. K.
82-000112

Karr, J. R.
82-000403
Kashiwagi, S.
82-000371
Kasuga, S.
82-000419
Katayama, T.
82-000037
82-000156
Kaufman, B.
82-000093
Kawai, K.
82-000369
82-000372
Kawasaki, L. Y.
82-000396
82-000404
82-000415
82-000416
Kazama, T. K.
82-000494
Keen, W. H.
82-000041
Keller, W.
82-000483
Kelly, P. R.
82-000232
Kelso, B. W.
82-000186
82-000187
Kemp, A.
82-000018
Kerby, J. H.
82-000014
Kesbeke, F.
82-000155
Keyes, R. S.
82-000204
Khakimullin, A. A.
82-000462
Khan, R. A.
82-000367
Killcreas, W.
82-000016
Kim, Ye. D.
82-000157
Kimura, T.
82-000368
Kircheis, F. W.
82-000463
Kitchell, J. F.
82-000282
Klauda, R. J.
82-000405
Klyashtorin, L. V.
82-000113
Klyukanov, V. A.
82-000341
Knudsen, J.
82-000105
Kobayashi, K.
82-000076
Kocan, R. M.
82-000427
Kochkin, P. N.
82-000291
Konchina, Yu. V.
82-000272
Kondo, H.
82-000143
Konosu, S.
82-000128
Kornfield, I.
82-000164
82-000477
Kornilova, G. N.
82-000273
Koss, T. F.
82-000114
Kothbauer, H.
82-000115
Kracht, R.
82-000213
Krajnovic-Ozretic, M.
82-000057
Kramer, D. L.
82-000116
Kraul, S.
82-000024
Kroll, W.
82-000248
Krylova, V. D.
82-000165
Kuehl, D. W.
82-000406
Kulczycki, G. R.
82-000443
Kumar, S.
82-000434
Kusuda, R.
82-000366
82-000369
82-000372
Kux, Z.
82-000058
Kuz'mina, V. V.
82-000117
Kuznetsov, A. A.
82-000103
Kuznetsov, V. A.
82-000331
Lackner, R.
82-000028
Lalancette, L.-M.
82-000470
Landolt, M. L.
82-000427
Lang, I.
82-000059
Lanigan, S. H.
82-000312
Lapin, Yu. Ye.
82-000102
LaPlace, J. A.
82-000472
Lasker, R.
82-000217

...CONTINUED...
Lasker, R.
82-000499
Lasta, C. A.
82-000242
82-000243
Lauder, G. V.
82-000060
Laudien, H.
82-000249
Laurs, R. M.
82-000499
Lavrova, Ye. A.
82-000133
Law, F. C. P.
82-000428
Layher, W. G.
82-000292
Layton, M.
82-000502
Leaney, A. J.
82-000493
Lear, H.
82-000367
Leatherland, J. F.
82-000119
LeBrasseur, R. J.
82-000474
Lebreton, J. D.
82-000473
Leggett, W. C.
82-000329
Leknes, I. L.
82-000061
Lemm, C. A.
82-000031
Lenanton, R. C. J.
82-000286
Leonard, E. N.
82-000406
Leong T. S.
82-000363
Leray, C.
82-000120
Lesel, R.
82-000118
Lethbridge, R. C.
82-000062
Levi, E. J.
82-000471
Lewis, G. E.
82-000225
82-000488
Lewis, R. E.
82-000070
Li, H. W.
82-000464
Li, S.
82-000019
82-000020
Libosvarsky, J.
82-000058
82-000063
82-000084
Lidgerding, B. C.
82-000365
Liem, K. F.
82-000060
Lin, W. L.
82-000032
Lincoln, R. F.
82-000166
Lindsay, B. P.
82-000304
Lisovenko, L. A.
82-000250
Litvinenko, N. I.
82-000064
Liu, J. K.
82-000032
Liu, X. Z.
82-000032
Livingston, J. M.
82-000426
Lobel, P. S.
82-000346
Lodenius, M.
82-000409
Lopes, R. A.
82-000100
Love, M. S.
82-000214
Luecke, C.
82-000274
Luempert, L. G. III
82-000167
Luk'yanenko, V. I.
82-000133
Lundberg, B.
82-000275
Lundqvist, H.
82-000160
Lusk, S.
82-000489
Luts, G. I.
82-000121
Maccioni, R. B.
82-000122
Macdonald, J. S.
82-000313
Maceina, M. J.
82-000001
MacGregor, R. III
82-000123
MacKenzie, K.
82-000385
Maeda, T.
82-000255
Magnin, E.
82-000314
Mais, K. F.
82-000226
Majkowski, J.
82-000124
Makeyeva, A. P.
82-000065
Makino, Y.
82-000283

Malhotra, J. C.
82-000022
Mallicoate, D. L.
82-000294
Maloiy, G. M. O.
82-000046
Malueg, K. W.
82-000414
Manooch, C. S. III
82-000456
Margiocco, C.
82-000421
Mari, A.
82-000293
Marliave, J. B.
82-000025
82-000033
Marsal, J.
82-000149
Marsh, A. C.
82-000260
Marshall, J.
82-000277
Marshall, K. E.
82-000502
Marshall, W. S.
82-000125
82-000126
Martin, F. D.
82-000227
Maruyama, T.
82-000251
Matheson, R. E., Jr.
82-000315
Mathias, J. A.
82-000465
Mathisen, O. A.
82-000228
Matsubara, J. A.
82-000188
Matsuda, T.
82-000371
Matsumiya, M.
82-000129
Matsumoto, W. M.
82-000494
Matsuzaki, K.
82-000283
Mattheeuws, A.
82-000407
Matthews, W. J.
82-000309
Maxwell, J. G. H.
82-000316
Mayer, F. L.
82-000053
82-000104
Mayes, M. A.
82-000386
Mazeaud, F.
82-000189
McBride, J. R.
82-000429
McCrone, L. E.
82-000276
McCune, A. R.
82-000066
McEachran, J. D.
82-000355
McKaye, K. R.
82-000190
Medved, R. J.
82-000277
Mehegan, J. P.
82-000116
Mehrle, P. M.
82-000053
82-000104
Mellado, W.
82-000122
Melodia, F.
82-000421
Mensi, P.
82-000421
Metallov, G. F.
82-000133
Meunier, F. J.
82-000067
Meyer, M. K.
82-000347
Micha, J.-C.
82-000407
Michel, C.
82-000370
Michibata, H.
82-000127
82-000430
Middaugh, D. P.
82-000252
82-000253
Mih, W. C.
82-000485
Miki, I.
82-000476
Miki, W.
82-000128
Miller, D. W.
82-000500
Miller, J. S.
82-000496
Miller, L. E.
82-000374
Miller, P. J.
82-000348
Miller, R. A.
82-000222
Minckley, W. L.
82-000327
Mirza, M. R.
82-000349
Miyashita, A.
82-000185
Miyazaki, C.
82-000203
Mochizuki, A.
82-000129

Mokady, S.
82-000036
Mokhtar, A. S. bin
82-000363
Moller, P.
82-000191
Monroe, R. J.
82-000107
Montgomery, W. L.
82-000012
Moon, P. A.
82-000209
Moon, T. W.
82-000130
Morales, J.
82-000362
Morata, P.
82-000131
Moreau, G.
82-000254
Morgan, D. A.
82-000364
Moring, J. R.
82-000003
Moriwaki, S.
82-000199
82-000200
Morris, J.
82-000093
Morris, R. G.
82-000225
Morris, S.
82-000493
Morris, S. M.
82-000132
Moser, H. G.
82-000068
82-000217
Moyle, P. B.
82-000464
Mugiya, Y.
82-000299
Mukhacheva, V. A.
82-000350
Munroe, T. A.
82-000387
Munshi, J. S. D.
82-000136
Murachi, S.
82-000199
82-000200
Murdy, E. O.
82-000317
Murthy, V. K.
82-000431
Murty, A. S.
82-000441
Naftel, G.
82-000202
Nagahama, Y.
82-000111
82-000154
Nagai, A.
82-000080
Nagasawa, K.
82-000388
Nagtegaal, D.
82-000321
Nagtegaal, D. A.
82-000318
Naiman, R. J.
82-000012
Nakamura, Y.
82-000419
Nakatani, T.
82-000255
Nalbant, T. T.
82-000349
National Academy of Sciences
82-000034
Natochin, Yu. V.
82-000133
Naughton, S. P.
82-000278
Nelson, D. O.
82-000192
Nelva, A.
82-000319
Neves, R. J.
82-000261
Ney, J. J.
82-000466
Nickum, J. G.
82-000029
82-000047
Nicol, J. A. C.
82-000055
82-000389
Niimi, A. J.
82-000408
Nikol'skiy, V. N.
82-000236
Nilsson, N.
82-000193
Nishi, K.
82-000134
Nishimura, M.
82-000203
Noakes, D. L. G.
82-000161
Noble, R. L.
82-000467
Noda, K.
82-000283
Northcote, T. G.
82-000186
82-000187
82-000193
Nose, Y.
82-000241
Novikov, G. G.
82-000112
Nuorteva, P.
82-000409
Nuorteva, S.-L.
82-000409
Nuti, R. N.
82-000119

Nyman, H.-G.
82-000432
O'Brien, W. J.
82-000274
O'Grady, K. T.
82-000410
O'Neil, P. E.
82-000215
Ofstad, E. B.
82-000433
Ogawa, T.
82-000200
Oguri, M.
82-000069
Ohta, T.
82-000135
Ohta, Y.
82-000203
Ojha, J.
82-000136
Okita, J.
82-000419
Olivereau, J. M.
82-000137
Olivereau, M.
82-000137
Olmsted, L. L.
82-000070
82-000211
Olsen, D. A.
82-000472
Olsen, H. F.
82-000320
Olson, R. E.
82-000376
Ono, S.
82-000080
Ooga, S.
82-000185
Oshiro, T.
82-000138
Ostermann, W.
82-000322
Otero, H.
82-000495
Otero, H. O.
82-000480
Ottaway, E. M.
82-000256
Otwell, W. S.
82-000139
Pacchetti, G.
82-000395
Palko, B. J.
82-000216
Pant, S. C.
82-000434
Papst, M.
82-000465
Parrish, P. R.
82-000425
Parrish, R. H.
82-000294
Partridge, B. L.
82-000194
Pascal, M.
82-000067
Patra, A. K.
82-000136
Pattee, E.
82-000295
82-000319
82-000473
Pawaputanon, K.
82-000390
Paxton, R.
82-000140
Payan, P.
82-000094
Pearson, R. E.
82-000264
Peck, T. H.
82-000405
Peden, A. E.
82-000321
82-000322
Pelaez, J.
82-000499
Penaz, M.
82-000010
Pequeno R., G.
82-000323
Perdomo, C.
82-000362
Peringer, P.
82-000118
Perkins, M. A.
82-000414
Perlmutter, A.
82-000142
Perrin, J. F.
82-000319
Perrotta, R.
82-000495
Persat, H.
82-000295
82-000319
Petenusci, S. O.
82-000100
Petukhov, S. A.
82-000435
Pharo, C. H.
82-000040
Phillips, R. R.
82-000195
Pic, P.
82-000094
Picquelle, S. J.
82-000231
Pietsch, T. W.
82-000351
Pinchuk, V. I.
82-000352
Poddubnyy, A. G.
82-000279
Poe, P. H.
82-000228

Pollard, J. F.
82-000455
Poluhowich, J. J.
82-000098
Portsev, P. I.
82-000280
Potter, I. C.
82-000062
82-000087
82-000286
Potts, G. W.
82-000281
Pozo, E.
82-000296
Prete, P. J.
82-000411
Prihoda, J.
82-000010
Prokes, M.
82-000297
Prosser, C. L.
82-000192
Protopopov, N. K.
82-000298
Putnam, M. E.
82-000426
Quiros, R.
82-000490
Raa, J.
82-000011
Rab, P.
82-000168
82-000169
Rafn, S.
82-000071
Randall, H. A.
82-000353
Randall, J. E.
82-000353
Randall, R. G.
82-000229
Randolph, J.
82-000451
Rao, D. M.
82-000441
Rappaport, U.
82-000036
Reader, N. A.
82-000256
Reddanna, P.
82-000431
Reed, J. K.
82-000257
Regier, H. A.
82-000444
Regis, J.
82-000473
Reice, S. R.
82-000042
Reichenbach-Klinke, H.-H.
82-000324
Reid, G. M.
82-000354
Reiling, S. D.
82-000457
Repko, F. F.
82-000400
Reshetnikov, Yu. S.
82-000341
82-000468
Reynolds, R. P.
82-000310
Reynolds, W. W.
82-000196
Rhoderick, J. C.
82-000436
Ribbink, A. J.
82-000260
Rice, G. K.
82-000405
Richards, W. J.
82-000216
Richardson, L. B.
82-000436
Richardson, S. L.
82-000355
Rickards, W. L.
82-000014
82-000139
Rimmer, D. M.
82-000197
Rinne, J. N.
82-000501
Robertson, D. A.
82-000052
Robertson, D. R.
82-000198
Roche, D. P.
82-000377
Rodgers, D. W.
82-000412
Romanenko, V. D.
82-000141
Rose, S. T.
82-000266
Rosen, M. H.
82-000142
Ross, J. L.
82-000456
Ross, L. G.
82-000262
Rounick, J. S.
82-000487
Roux, A. L.
82-000319
Rudometkina, G. P.
82-000072
Ruiz, R. A.
82-000362
Rumsey, G. L.
82-000029
Ryan, P. A.
82-000325
Ryan, P. M.
82-000413
Saarikoski, J.
82-000437

Sadler, K.
82-000438
Saetersdal, T. S.
82-000061
Saito, K.
82-000419
Saito, T.
82-000143
Sakai, D. K.
82-000144
Sale, P. F.
82-000230
Salikzyanov, R. F.
82-000113
Saloman, C. H.
82-000278
Samarakoon, J. I.
82-000258
Sanchez-Medina, F.
82-000131
Sanchez, R. P.
82-000242
82-000243
Sandnes, K.
82-000145
Sanh, T. D.
82-000265
Santacana, J. A.
82-000362
Sasaki, K.
82-000439
Sasaki, S.
82-000326
Saunders, R. L.
82-000110
Savvaitova, K. A.
82-000341
Sawaya, P.
82-000100
Sayfullin, R. R.
82-000146
Sazonov, Yu. I.
82-000356
Schene, T.
82-000309
Schenkel-Brunner, H.
82-000115
Schlieker, V.
82-000249
Schweigert, J. F.
82-000073
Scott, D. P.
82-000449
Scott, G. I.
82-000253
Seki, H.
82-000474
Sekitani, T.
82-000200
Senn, D. G.
82-000074
Serebryakova, Ye. V.
82-000171
Sesso, A.
82-000049
Seth, R. N.
82-000022
Seymour, E. A.
82-000021
Shaboneyev, I. Ye.
82-000357
Shang, Y. C.
82-000004
Shaposhnikova, G. Kh.
82-000341
Shaw, R. F.
82-000304
Sheldon, J. M.
82-000198
Shell, E. W.
82-000013
Shimazaki, K.
82-000326
Shireman, J. V.
82-000001
Shoubridge, E. A.
82-000147
Sideleva, V. G.
82-000075
Sidell, B. D.
82-000150
Sieswerda, P. L.
82-000026
Sill, B. L.
82-000070
Simpson, C. F.
82-000420
Simpson, K.
82-000476
Simpson, K. L.
82-000156
Singh, S. P.
82-000022
Sirotek, D.
82-000056
Sissenwine, M. P.
82-000445
Skow, L. C.
82-000148
Slaughter, D.
82-000106
Sloane-Richey, J.
82-000414
Small, D. P.
82-000003
Smith, D.
82-000477
Smith, D. C.
82-000003
Smith, N. K. R.
82-000440
Smith, P. E.
82-000217
Snetkov, M. A.
82-000468
Sokolov, L. I.
82-000171

Solsona, C.
82-000149
Sorensen, E. M. B.
82-000440
Springer, V. G.
82-000358
Srivastava, K. P.
82-000022
Stanford, J. A.
82-000411
Stanley, J. G.
82-000463
Stauffer, G. D.
82-000231
Stauffer, T. M.
82-000475
Steene, R. C.
82-000317
Stein, D. L.
82-000218
Sterba, O.
82-000063
Stewart, D. J.
82-000282
Stocker, M.
82-000481
Stone, B. B.
82-000150
Stoneking, M.
82-000359
Storozhuk, N. G.
82-000435
Stroband, H. W. J.
82-000151
Struthers, G.
82-000262
Suarez, R. K.
82-000152
Sugimoto, N.
82-000371
Sugiyama, A.
82-000369
82-000372
Sullivan, C. R.
82-000450
Sullivan, E.
82-000454
Sunada, J. S.
82-000232
Suzuki, K.
82-000076
82-000153
82-000154
82-000219
Suzuki, T.
82-000498
Swarup, P. A.
82-000441
Swears, S. B.
82-000195
Szabo, T.
82-000191
Tacon, A. G. J.
82-000035
Takahashi, M.
82-000199
82-000200
Takeda, M.
82-000439
Tamaoki, B.
82-000153
Tamaoki, B.-I.
82-000154
Tanaka, K.
82-000299
Tanaka, Y.
82-000037
82-000076
82-000156
82-000219
Taniuchi, T.
82-000241
Tarifeno-Silva, E.
82-000396
82-000404
82-000415
82-000416
Taylor, J. L.
82-000457
Taylor, L. R.
82-000202
Taylor, W. W.
82-000233
Tesch, F.-W.
82-000213
Teshima, K.
82-000077
Teskeredzic, Z.
82-000259
Thakur, N. K.
82-000238
Thomas, G. L.
82-000484
Thompson, J. M.
82-000234
Thompson, N. P.
82-000420
Thorne, R. E.
82-000484
Thorpe, J. E.
82-000262
Thorson, T. B.
82-000386
Tidemann, E.
82-000011
Tocko, M. N.
82-000233
Todd, G. T.
82-000201
Todd, P. R.
82-000027
82-000263
Tormosova, I. D.
82-000235
Torrissen, O.
82-000011
Toulorge, J. F.
82-000158

Townsend, D. W.
82-000304
Toyoda, J.
82-000143
Tracey, D. M.
82-000417
Trent, L.
82-000099
Triantaphyllidis, C. D.
82-000170
Tricas, T. C.
82-000202
Tsai, C.-F.
82-000442
Tsepkin, Ye. A.
82-000497
Tsuchiya, A.
82-000203
Turnpenny, A. W. H.
82-000478
Uchiyama, M.
82-000439
Ueno, S.
82-000219
Uotani, I.
82-000283
Utida, T.
82-000185
van den Broek, W. L. F.
82-000417
Van Der Veen, F. H.
82-000151
Van Korlaar, F.
82-000108
Vargas, A. M.
82-000131
Vari, R. P.
82-000360
Vasil'yev, V. P.
82-000171
Veiluva, M.
82-000446
Veith, G. D.
82-000406
Verma, S. R.
82-000418
Vierke, J.
82-000361
Viluksela, M.
82-000437
Viola, S.
82-000036
Vogel, D.
82-000347
Voskoboynikova, O. S.
82-000078
Vostradovsky, J.
82-000220
Vsiansky, P.
82-000109
Vyshegorodtsev, V. A.
82-000079
Waarde, A. van
82-000155
Wagner, D. J.
82-000359
Wahle, R. J.
82-000264
82-000486
Waiwood, K. G.
82-000124
Waldrop, J.
82-000016
Waldrop, J. E.
82-000496
Wallace, J.
82-000286
Wankowski, J. W. J.
82-000300
Watts, W.
82-000262
Webb, P. W.
82-000204
Wehrhahn, C. F.
82-000187
Westphal, W. V.
82-000214
Wheatley, G. A.
82-000221
Whitaker, D. J.
82-000375
White, F. H.
82-000420
White, R. J.
82-000182
Whitfield, A. K.
82-000044
Whoriskey, F. G.
82-000012
Wiegand, R. C.
82-000040
Wieser, W.
82-000028
Wild, A.
82-000482
Wiley, R. W.
82-000447
Williams, E. H., Jr.
82-000391
Williams, L. B.
82-000391
Williams, T. D.
82-000054
Wingstrand, K. G.
82-000071
Winterbourn, M. J.
82-000487
Wirtz, P.
82-000333
Witzell, W. N.
82-000284
Wolters, W. R.
82-000172
Woods, L. C. III
82-000014
Woodward, S.
82-000003

Wooley, C. M.
82-000209
Wydoski, R. S.
82-000469
Yahnke, J. W.
82-000491
Yamada, J.
82-000299
Yamada, S.
82-000037
82-000156
Yamaguchi, K.
82-000128
Yamamoto, S.
82-000326
Yamamoto, Y.
82-000205
Yamashita, I. S.
82-000232
Yamazoe, Y.
82-000173
Yasuno, M.
82-000419
Yatomi, H.
82-000185
Ydenberg, R. C.
82-000269
Yoneda, M.
82-000369
82-000372
Yoshimizu, M.
82-000368
Yoshioka, T.
82-000080
Yoshiyama, R. M.
82-000206
Yoshizaki, K.
82-000081
Young, C.
82-000327
Youson, J. H.
82-000091
Yu, D. P.
82-000396
82-000404
82-000415
82-000416
Zamora, S.
82-000131
Zhukinskiy, V. N.
82-000157
Zhuravel', V. N.
82-000102
Zikic, R.
82-000057
Zimmerman, E. G.
82-000177
Zinov'yev, Ye. A.
82-000341
Zolotnitskiy, A. P.
82-000005
Zuyev, G. V.
82-000236

Zwerner, D. E.
82-000387

frica
82-000333
labama: Clay Cty.: Barbaree Ck.
82-000215
laska
82-000328
laska: Bristol Bay: Kvichak River
82-000228
rabian Sea
82-000223
rgentina
82-000242
82-000243
82-000495
rgentina: Salto Grande Reservoir
82-000490
rizona: Yavapai Cty.
82-000327
tlantic Ocean
82-000303
82-000397
tlantic Ocean, North
82-000212
82-000259
82-000261
82-000304
82-000458
tlantic Ocean, Tropical
82-000072
ustralia
82-000307
ustralia: Great Australian Bight
82-000316
ustralia: Queensland
82-000320
ustralia: Western Australia: Swan-Avon River System
82-000286
ahama Islands
82-000178
ermuda
82-000340
orneo
82-000361
razil
82-000386
alifornia
82-000096
82-000206
82-000244
82-000499
anada
82-000234
anada: British Columbia
82-000186
82-000193
82-000313
82-000318
82-000321
82-000322
82-000476
anada: British Columbia: Barkley Sound
82-000222
Canada: British Columbia: Bella Coola River Estuary
82-000493
Canada: British Columbia: Kootenay Lake
82-000040
Canada: James Bay
82-000314
Canada: New Brunswick
82-000229
Canada: Nova Scotia
82-000293
Canada: Ontario
82-000381
82-000413
Canada: Ontario: Bruce Peninsula
82-000308
Canada: Ontario: George Lake
82-000483
Canada: Ontario: Lake Opinicon
82-000336
Canada: Ontario: Laurel Creek
82-000373
Canada: Ontario: Ottawa River
82-000393
Canada: Quebec: Moisie River
82-000460
Chile
82-000323
Colorado
82-000448
Colorado: Twin Lakes
82-000452
82-000484
Columbia River
82-000159
Columbia River: John Day Reservoir
82-000285
Czechoslovakia
82-000220
England
82-000290
82-000378
82-000379
England: River Trent
82-000221
Fiji Islands
82-000325
Finland
82-000409
Florida
82-000257
82-000302
82-000315
82-000454
Florida: Apalachicola River
82-000209
Florida: Dade Cty.
82-000268
Florida: Lake Baldwin
82-000001
France
82-000295
82-000370

France: Rhone River
82-000319
Gabon
82-000360
Great Lakes
82-000406
Gulf of Mexico
82-000301
82-000310
82-000315
Hawaii
82-000202
82-000494
Indian Ocean
82-000210
82-000273
82-000280
82-000281
82-000305
82-000311
Iran
82-000339
Italy
82-000002
Italy: River Po
82-000395
Japan
82-000023
82-000207
82-000255
82-000474
Japan: Lake Kuttara
82-000498
Japan: Mt. Tsukuba
82-000419
Japan: River Yura
82-000251
Lake Michigan
82-000282
Louisiana: Vermilion Bay
82-000455
Maine
82-000003
82-000457
Maine: Gulf of Maine
82-000304
Malaysia
82-000363
Mexico: Chiapas
82-000347
Michigan
82-000182
Mozambique
82-000305
Nebraska: Norden Reservoir
82-000491
Netherlands
82-000400
New York: Hudson River Estuary
82-000405
New Zealand
82-000246
82-000263

...CONTINUED...

New Zealand
82-000307
82-000487
North Carolina
82-000456
North Carolina: Lake Norman
82-000377
North Carolina: Stokes Cty.: Belews
82-000399
Norway: Lake Arungen
82-000270
Oklahoma: Broken Bow Dam
82-000451
Oklahoma: Mayes Cty.: Grand River
82-000309
Oklahoma: Mountain Fork River
82-000451
Oregon
82-000218
Pacific Ocean
82-000214
82-000218
82-000226
82-000231
82-000232
82-000234
82-000242
82-000243
82-000244
82-000272
82-000276
82-000283
82-000284
82-000294
82-000300
82-000313
82-000316
82-000318
82-000321
82-000322
82-000326
82-000332
82-000346
82-000375
82-000495
82-000499
Papua New Guinea
82-000300
Peru
82-000272
Philippines
82-000317
Poland
82-000289
82-000297
Poland: Musov Reservoir
82-000489
Puerto Rico
82-000227
Rhode Island
82-000397
Sargasso Sea
82-000213

Scotland
82-000212
Scotland: Loch Voil
82-000262
South Carolina: Cherokee Cty.:
Ninety-Nine Islands Impoundment
82-000374
South Carolina: Oconee Cty.: Howard Creek
82-000211
Tahiti
82-000343
Texas
82-000315
Tonga Islands
82-000284
United States, Southeastern
82-000467
United States, Western
82-000469
United States: New England
82-000463
USSR
82-000288
82-000298
82-000337
82-000342
82-000462
82-000497
USSR: Kuybyshev Reservoir
82-000331
Utah: White River
82-000312
Virgin Islands
82-000472
Virginia: Chincoteague Bay
82-000277
Washington: Seattle
82-000414
West Germany: Danube River
82-000324
West Indies
82-000391
West Virginia: Mineral Cty.
82-000225
West Virginia: New Creek Lake
82-000488
Yugoslavia: Lake Ohrid
82-000233

Abramis brama
Age/Growth
82-000289
82-000290
Amino Acids
82-000157
Condition Factors
82-000289
Digestive System
82-000117
Eggs
82-000157
Enzymes
82-000117
Lipid Composition
82-000157
Mortality Rates
82-000289
Year Class Strength
82-000290
Abramis farenus
Heavy Metals
82-000409
Mercury
82-000409
Acerina cernua
Light
82-000088
Reproduction
82-000088
Temperature
82-000088
Acipenser baeri
Culture/Propagation
82-000462
Karyotypes
82-000171
Stocking/Introductions
82-000462
Acipenser guldenstadti
Magnesium
82-000133
Osmoregulation
82-000133
Acipenser ruthenus
Maturation
82-000146
Reservoir Release Effects
82-000146
Acipenser stellatus
Age/Length Composition
82-000245
Amino Acids
82-000083
Hormones
82-000103
Maturation
82-000245
Alburnoides bipunctatus ohridanus
Life History/General
82-000233
Population Studies
82-000233
Aldrichetta forsteri
Age/Growth
82-000286
Movements
82-000286
Alepisaurus
Meristic Studies
82-000050
Variation Studies
82-000050
Alepisaurus ferox
Musculature
82-000080
Allosmerus elongatus
Distribution/Geographical
82-000313
Alos apseudoharengus
Population Studies
82-000488
Alosa aestivalis
Distribution/Seasonal
82-000261
Alosa pseudoharengus
Distribution/Seasonal
82-000261
Forage Introductions
82-000488
Management/Research--Ponds
82-000488
Predator/Prey Relationships
82-000282
Ambloplites rupestris
Acid Precipitation
82-000413
Age/Growth
82-000413
Anabas testudineus
Spawning
82-000238
Anableps anableps
Reproductive System
82-000051
Anableps dowi
Reproductive System
82-000051
Anguilla
Culture/Propagation
82-000027
Distribution/Geographical
82-000213
Distribution/Vertical
82-000213
Induced Maturation
82-000027
Life History/General
82-000213
Movements
82-000263
Spawning
82-000213
Anguilla anguilla
Ammonia
82-000438

...CONTINUED...
Anguilla anguilla
Culture/Propagation
82-000438
Protein Synthesis
82-000109
Temperature
82-000109
Anguilla japonica
Bacterial Diseases
82-000366
82-000371
Edwardsiella tarda
82-000366
Flexibacter columnaris
82-000371
Parasites/Diseases
82-000366
82-000371
Anguilla rostrata
Blood Chemistry
82-000098
Lipid Composition
82-000139
Lipid Content
82-000139
Anguilla anguilla
Age/Growth
82-000287
Apeltes quadracus
Ecology
82-000045
Meristic Studies
82-000045
Aphyosemion gardneri
Spawning
82-000248
Archomenidia
Taxonomy
82-000338
Aristichthys nobilis
Nutrition
82-000032
Barbus conchonius
Carbamates
82-000434
Insecticides
82-000434
Temik
82-000434
Barbus meridionalis
Electrophoresis
82-000170
Variation Studies
82-000170
Blennius ponticus
Taxonomy
82-000334
Bodianus prognathus
New Species
82-000346
Brachydanio nigrofasciatus
Alcohol Dehydrogenase
82-000101
Brachydanio rerio
Heavy Metals
82-000432
Lead
82-000432
Predator/Prey Relationships
82-000432
Brama japonica
Distribution/Geographical
82-000326
Distribution/Seasonal
82-000326
Brevoortia
Nets/Netting
82-000471
Purse Seines
82-000471
Brevoortia patronus
Marking/Tagging
82-000461
Butis butis
Distribution/Geographical
82-000325
Bythitidae
Distribution/Geographical
82-000303
Carangidae
Culture/Propagation
82-000185
Orientation/Homing
82-000185
Predator/Prey Relationships
82-000281
Carassius auratus
Anoxia
82-000147
Enzymes
82-000142
Induced Ovulation
82-000111
Metabolic Rates
82-000140
Metabolism
82-000155
Nitrogen
82-000155
Osmoregulation
82-000137
Phosphates
82-000439
Reproduction
82-000111
Temperature
82-000114
82-000140
Carassius auratus gibelio
Age/Growth
82-000288
Age/Length Composition
82-000288
Osmoregulation
82-000097
Scales
82-000288

Carassius carassius
Culture/Propagation
82-000021
Induced maturation
82-000021
Light
82-000021
Temperature
82-000021
Carcharhinus
Distribution/Geographical
82-000301
Carcharhinus plumbeus
Foods/Feeding
82-000277
Catostomus commersoni
Cnidospora
82-000373
Parasites/Diseases
82-000373
Protozoan Diseases
82-000373
Catostomus macrocheilus x C. columbianus
Hybridization
82-000159
Caulolatilus bermudensis
New Species
82-000340
Cebidichthys violaceus
Digestive System
82-000096
Foods/Feeding
82-000096
Centropyge
Spawning
82-000239
Chaenogobius
Taxonomy
82-000352
Chaetodon
Anilocra
82-000391
Parasites/Diseases
82-000391
Parasitic Isopods
82-000391
Chalcalburnus chalcoides
Temperature
82-000082
Channa
Air Breathing
82-000136
Chasmodes bosquianus
Activity Patterns
82-000195
Cheilotrema saturnum
Spawning
82-000247
Chelon labrosus
Ergenstrema labrosi
82-000378
Gill Parasites
82-000378

...CONTINUED...
Chelon labrosus
Parasites/Diseases
82-000378
82-000379
Trematodes
82-000378
82-000379
Cirrhilabrus temminckii
Early Development
82-000076
Cirrhinus mrigala
Endosulfan
82-000441
Insecticides
82-000441
Clupea harengus
Auditory Senses
82-000175
82-000176
Startle Response
82-000175
82-000176
Clupea harengus harengus
Electrophoreis
82-000163
Electrophoresis
82-000163
Meristic Studies
82-000073
Variation Studies
82-000163
82-000163
Clupea harengus pallasi
Electrophoresis
82-000163
Variation Studies
82-000163
82-000163
Clupeonella delicatula
Salinity
82-000121
Sperm
82-000121
Coelonotus argulus
Distribution/Geographical
82-000325
Comephoridae
Seismosensory System
82-000075
Coregonidae
Stocking/Introductions
82-000468
Coregonus clupeaformis
Exploitation Rates
82-000224
Population Studies
82-000224
Spawning
82-000254
Coregonus fera
Age/Growth
82-000306
Biochemical Composition
82-000306

Coregonus lavaretus
Salinity
82-000102
Coregonus lavaretus pidschian
Age/Growth
82-000298
Scales
82-000298
Coregonus sardinella marisalbi
Salinity
82-000102
Coryphaena hippurus
Locomotion
82-000204
Coryphaenoides holotrachys
Fecundity
82-000250
Cottidae
Seismosensory System
82-000075
Cottus rhotheus
Predator/Prey Relationships
82-000266
Ctenopharyngodon
Anatomy
82-000344
Taxonomy
82-000344
Ctenopharyngodon idella
Aquatic Plant Control
82-000001
Digestive System
82-000151
Foods/Feeding
82-000265
Cyprinidae
Reproductive System
82-000063
Cyprinodon
Electrophoresis
82-000345
Taxonomy
82-000345
Variation Studies
82-000345
Cyprinodon variegatus
Industrial Wastes
82-000425
Cyprinus carpio
Amino Acids
82-000037
Blood Chemistry
82-000085
Culture/Propagation
82-000036
Feeding Experiments
82-000036
82-000037
Feeds
82-000036
Fin Rays
82-000067

...CONTINUED...
Cyprinus carpio
Nervous System
82-000122
Tubulin
82-000122
Vision
82-000143
Dallia asmirabilis
New Species
82-000337
Dasyatis centroura
Spawning
82-000257
Dasyatis sabina
Corneal Injuries
82-000389
Parasites/Diseases
82-000389
Dorosoma cepedianum
Karyotypes
82-000162
Dorosoma petenense
Karyotypes
82-000162
Doryichthys retzi
Distribution/Geographical
82-000325
Echeneis naucrates
Life History/General
82-000210
Eigenmannia
Electrolocation
82-000188
Eleotridae
Taxonomy
82-000342
Eleotris maltzani
Taxonomy
82-000348
Elops saurus
Vision
82-000055
Engraulis anchoita
Population Studies
82-000243
Spawning
82-000243
Engraulis mordax
Age/Growth
82-000294
Age/Length Composition
82-000226
82-000232
Biomass
82-000231
Population Studies
82-000226
82-000231
82-000232
Remote Sensing
82-000499
Spawning
82-000499

...CONTINUED...
Engraulis mordax
Year Class Strength
82-000226
Esox lucius
Age/Growth
82-000220
Foods/Feeding
82-000220
Heavy Metals
82-000409
Life History/General
82-000220
Mercury
82-000409
Etelis
Taxonomy
82-000332
Etelis radiosus
New Species
82-000332
Etheostoma coosae
Life History/General
82-000215
Etroplus maculatus
Spawning
82-000258
Etroplus suratensis
Spawning
82-000258
Eucinostomus melanopterus
Distribution/Geographical
82-000315
Eupomacentrus
Communication
82-000174
Sound Production
82-000174
Eupomacentrus planifrons
Territorial Behavior
82-000198
Exocoetidae
Abundance
82-000236
Distribution/Geographical
82-000311
Fundulus
Karyotypes
82-000164
Sex Determination
82-000164
Fundulus heteroclitus
Metabolic Rates
82-000140
Temperature
82-000140
Gadus morhua
Antifreeze Production
82-000106
Ascorbic Acid
82-000145
Bacterial Diseases
82-000367
Blood Chemistry
82-000112
...CONTINUED...
Gadus morhua
Fin Rot
82-000367
Locomotion
82-000179
Parasites/Diseases
82-000367
Reproduction
82-000145
Galeocerdo cuvier
Activity Patterns
82-000202
Gambusia affinis
Light
82-000134
Reproduction
82-000134
Geotria australis
Biochemical Composition
82-000087
Dentition
82-000062
Metamorphosis
82-000062
82-000087
Mouth Parts
82-000062
Gilchristella aestuarius
Body Form
82-000044
Gillichthys mirabilis
Osmoregulation
82-000125
82-000126
Rubidium
82-000125
Girella nigricans
Cleaning Behavior
82-000180
Gnathonemus petersii
Electrical Communication
82-000191
Gobio gobio
Mersitic Studies
82-000058
Gonostoma atlanticum
Early Development
82-000072
Haplochromis livingstoni
Death Feigning
82-000190
Hermosilla azurea
Cleaning Behavior
82-000180
Holanthias martinicensis
Hermaphroditism
82-000092
Hoplostethus atlanticus
Heavy Metals
82-000417
Mercury
82-000417
Hucho hucho
Culture/Propagation
82-000010

...CONTINUED...
Hucho hucho
Early Development
82-000010
Embryology
82-000010
Huso huso x Acipenser stellatus
Hybridization
82-000165
Morphology
82-000165
Hypleurochilus aequipinnis
Taxonomy
82-000333
Hypodytes rubripinnis
Life History/General
82-000219
Spawning
82-000219
Hypophthalmichthys
Anatomy
82-000344
Taxonomy
82-000344
Hypophthalmichthys molitrix
Culture/Propagation
82-000415
Gills
82-000056
Nutrition
82-000032
Respiratory System
82-000056
Sewage Effluents
82-000415
Hypostomus regani
Air Breathing
82-000100
Blood Chemistry
82-000100
Ichthyococcus
Distribution/Geographical
82-000350
Taxonomy
82-000350
Ictalurus nebulosus
Nutrient Cycling
82-000041
Phosphorus
82-000041
Ictalurus punctatus
Age/Growth
82-000292
Arsenic
82-000440
Culture/Propagation
82-000015
82-000016
82-000496
Heavy Metals
82-000440
Marketing
82-000496
Piscicides
82-000104
...CONTINUED...
Ictalurus punctatus
Polyculture
82-000015
Skeletal System
82-000104
Toxaphene
82-000104
Triploid Fish
82-000172
Vitamins
82-000104
Ictiobus cyprinella
Embryology
82-000065
Jenynsia lineata
Reproductive System
82-000051
Katsuwonus pelamis
Age/Growth
82-000300
Labeo werneri
Taxonomy
82-000354
Labroides dimidiatus
Early Development
82-000076
Lagocephalus sceleratus
Distribution/Geographical
82-000307
Lampanycutus macropterus
Distribution/Geographical
82-000335
Identification
82-000335
Taxonomy
82-000335
Latridopsis ciliaris
Spawning Migration
82-000246
Leiostomus xanthurus
Bromate
82-000436
Temperature
82-000107
Thermal Shock
82-000107
Lepomis
Identification
82-000336
Lepomis cyanellus
Nervous System
82-000192
Temperature
82-000192
Lepomis gibbosus
Actinocleidus oculatus
82-000381
Actinocleidus recurvatus
82-000381
Parasites/Diseases
82-000381
Trematodes
82-000381

Lepomis macrochirus
Foods/Feeding
82-000200
82-000274
Hydrazine
82-000426
pH
82-000411
Pollution Avoidance
82-000411
Population Studies
82-000225
Predator/Prey Relationships
82-000274
Leuciscus cephalus
Age/Growth
82-000297
Limanda yokohamae
Reproduction
82-000138
Liparididae
Life History/General
82-000218
Lophogobius cyprinoides
Foods/Feeding
82-000268
Luciocephalus pulcher
Foods/Feeding
82-000060
Mouth Parts
82-000060
Lutjanus analis
Age/Growth
82-000296
Macropodus
Nervous System
82-000093
Olfaction
82-000093
Macrouridae
Life History/General
82-000218
Mallotus villosus
Abundance/Factors of
82-000329
Year Class Strength
82-000329
Marcusenius isidori
Coloration
82-000081
Marcusenius longianalis
Coloration
82-000081
Medialuna californiensis
Distribution/Geographical
82-000318
Melanogrammus aeglefinus
Year Class Strength
82-000235
Menidia menidia
Spawning
82-000252

...CONTINUED...
82-000253
Merluccius bilinearis
Age/Growth
82-000293
Distribution/Geographical
82-000293
Merluccius hubbsi
Population Studies
82-000242
82-000480
Spawning
82-000242
Merluccius productus
Kudoa
82-000375
Parasites/Diseases
82-000375
Protozoan Diseases
82-000375
Microgadus tomcod
Polychlorinated Biphenyls
82-000405
Microgmathus pygmaeus
New Species
82-000343
Micropterus
Competition
82-000267
Foods/Feeding
82-000267
Micropterus salmoides
Population Studies
82-000225
Morone saxatilis
Bromate
82-000436
Cannibalism
82-000013
Culture/Propagation
82-000013
Life History/General
82-000209
Population Studies
82-000209
Temperature
82-000150
Morone saxatilis x M. chrysops
Culture/Propagation
82-000014
Tank Culture
82-000014
Mugil cephalus
Age/Growth
82-000286
Movements
82-000286
Mugil liza
Spawning
82-000237
Mustelus griseus
Embryology
82-000077
Myctophidae
Population Studies
82-000223

Mystus seenghala
Culture/Propagation
82-000022
Fingerling Production
82-000022
Nannocharax maculicauda
New Species
82-000360
Naucrates ductor
Distribution/Geographical
82-000321
Neoceratodus forsteri
Culture/Propagation
82-000018
Digestive System
82-000071
Neophrynichthys marmoratus
Distribution/Geographical
82-000323
Nezumia bairdii
Diclidophora nezumiae
82-000387
Parasites/Diseases
82-000387
Trematodes
82-000387
Notemigonus crysoleucas
Culture/Propagation
82-000416
Heavy Metals
82-000416
Sewage Effluents
82-000404
82-000416
Notopterus notopterus
Heavy Metals
82-000418
Notropis cornutus
Schooling Behavior
82-000161
Variation Studies
82-000161
Notropis lutrensis
Sewage Effluents
82-000404
Notropis venustus
Temperature
82-000177
Temperature Selection
82-000177
Odontogadu meriangus euxinus
Metabolic Rates
82-000113
Omobranchini
Taxonomy
82-000358
Omobranchus robertsi
New Species
82-000358
Omox lupus
New Species
82-000358
Oncorhynchus gorbuscha
Salinity
82-000102
Spawning
82-000240
Oncorhynchus keta
Heavy Metals
82-000435
Mercury
82-000435
Oncorhynchus kisutch
Culture/Propagation
82-000007
82-000008
82-000009
Foods/Feeding
82-000269
Heavy Metals
82-000435
Induced Maturation
82-000007
82-000008
82-000009
Mercury
82-000435
Territorial Behavior
82-000269
Oncorhynchus masou
Spawning
82-000251
Oncorhynchus nerka
Fertilization/Soil and Water
82-000476
Herbicides
82-000429
Nursery Lakes
82-000476
Parasites/Diseases
82-000390
Parasitic Copepods
82-000390
Population Studies
82-000228
82-000498
Salmincola californiensis
82-000390
2,4-D
82-000429
Oncorhynchus rhodurus
Reproduction
82-000154
Steroids
82-000154
Oncorhynchus tshawytscha
Amino Acids
82-000006
Culture/Propagation
82-000006
Fertilization/Soil and Water
82-000006
Movements
82-000264
Nutrition
82-000006

...CONTINUED...
Oncorhynchus tshawytscha
Restoration of Anadromous Runs
82-000486
Ophidiidae
Distribution/Geographical
82-000303
Opsanus tau
Activity Patterns
82-000195
Enzymes
82-000132
Swimbladder
82-000132
Orthodon microlepidotus
Hypoxia
82-000089
Respiration
82-000089
Oryzias latipes
Cadmium
82-000430
Embryology
82-000135
Heavy Metals
82-000430
Phosphates
82-000439
Osmerus mordax
Predator/Prey Relationships
82-000282
Pagrus major
Culture/Propagation
82-000023
Paraliparis rosaceus
Distribution/Geographical
82-000322
Parophrys vetulus
Glugea stephani
82-000376
Parasites/Diseases
82-000376
Protozoan Diseases
82-000376
Parosphromenus filamentosus
New Species
82-000361
Peociliopsis occidentalis occidentalis
Floods
82-000327
Status
82-000327
Perca flavescens
Acid Precipitation
82-000413
Age/Growth
82-000413
Gill Parasites
82-000382
Parasites/Diseases
82-000382
82-000383
Trematodes
82-000382

...CONTINUED...
82-000383
Urocleidus adspectus
82-000382
82-000383
Perca fluviatilis
Bacterial Diseases
82-000370
Foods/Feeding
82-000270
Parasites/Diseases
82-000370
Reproductive System
82-000059
Petromyzon marinus
Fish Control/Removal
82-000459
Metamorphosis
82-000091
Sterilization
82-000459
Petrotilapia
Distribution/Vertical
82-000260
Hydrostatic Pressure
82-000260
Pimelodus maculatus
Liver
82-000049
Pimephales promelas
Cnidospora
82-000373
Culture/Propagation
82-000416
Heavy Metals
82-000416
Parasites/Diseases
82-000373
Protozoan Diseases
82-000373
Sewage Effluents
82-000404
82-000416
Platichthys flesus
Lipid Metabolism
82-000105
Temperature
82-000105
Platytroctidae
Taxonomy
82-000356
Plecoglossus altivelis
Bacterial Diseases
82-000369
82-000372
Hormones
82-000153
Life History/General
82-000207
Parasites/Diseases
82-000369
82-000372
Reproduction
82-000153

...CONTINUED...
Plecoglossus altivelis
Streptococcus
82-000369
82-000372
Taxonomy
82-000207
Vibrio anguillarum
82-000369
Pleuronectes platessa
Amino Acids
82-000130
Metabolism
82-000130
Pleuronectes platessa x Platichthys flesus
Hybridization
82-000166
Maturation
82-000166
Triploid Fish
82-000166
Poecilia reticulata
Air Breathing
82-000116
Copper
82-000442
Heavy Metals
82-000442
Hypoxia
82-000116
Phenols
82-000437
Spawning
82-000249
Temperature
82-000249
Poeciliopsis knilickai
New Species
82-000347
Pomacentrus partitus
Anilocra
82-000391
Parasites/Diseases
82-000391
Parasitic Isopods
82-000391
Pomatomus saltatrix
Blood Chemistry
82-000123
Reproduction
82-000123
Pomatoschistus norvegicus
Life History/General
82-000212
Porichthys notatus
Age/Growth
82-000208
Foods/Feeding
82-000208
Potamotrygon circularis
Paraheteronchocotyle amazonensis
82-000386
Parasites/Diseases
82-000386

...CONTINUED...
Potamotrygon circularis
Potamotrygonocotyle tsalickisi
82-000386
Trematodes
82-000386
Promicrops lanceolatus
Foods/Feeding
82-000284
Predator/Prey Relationships
82-000284
Protopterus aethiopicus
Musculature
82-000046
Pseudojuloides
Taxonomy
82-000353
Pseudophoxinus persidis
New Species
82-000339
Psychrolutes phrictus
Distribution/Geographical
82-000322
Pterophyllum eimekei
Locomotion
82-000179
Ptychocheilus lucius
Culture/Propagation
82-000017
Raceway Culture
82-000017
Pylodictis olivaris
Age/Growth
82-000292
Quintana atrizona
Maturation
82-000084
Meristic Studies
82-000084
Morphology
82-000084
Rhincodon typus
Distribution/Geographical
82-000310
Rhizoprionodon
Distribution/Geographical
82-000301
Rhodoniichthys
Taxonomy
82-000352
Rutilus rutilus
Foods/Feeding
82-000270
Thermal Pollution
82-000407
Rutilus rutilus hecheli
Amino Acids
82-000157
Eggs
82-000157
Lipid Composition
82-000157
Salmo clarki
Competition
82-000193

Salmo gairdneri
Acanthocephala
82-000388
Acanthocephalus lucidus
82-000388
Alimentary Tract/Bacterial Flora
82-000118
Amino Acids
82-000156
Ammonia
82-000421
Anesthetics
82-000422
Blood Chemistry
82-000085
Competition
82-000193
Copper
82-000205
82-000423
Culture/Propagation
82-000011
82-000029
82-000465
Currents
82-000187
Diets
82-000029
Digestive System
82-000048
Enzymes
82-000131
Heavy Metals
82-000205
82-000412
82-000423
Hexachlorobenzene
82-000408
Hormones
82-000119
Life History/General
82-000211
Lipid Content
82-000119
Lipid Metabolism
82-000090
Mercury
82-000412
Nitrogen Mustard
82-000424
Nutrition
82-000029
82-000030
Osmoregulation
82-000094
Parasites/Diseases
82-000388
Pigmenters
82-000011
Rheotropism
82-000186
82-000187

...CONTINUED...
Salmo gairdneri
Starvation
82-000131
Thiourea
82-000095
Vitamins
82-000030
2-Phenoxyethanol
82-000422
Salmo salar
Age/Growth
82-000160
Culture/Propagation
82-000031
Diets
82-000031
Feeding Experiments
82-000031
Habitat Selection
82-000197
Maturation
82-000160
Movements
82-000262
Parr-Smolt Transformation
82-000110
Population Studies
82-000229
Production
82-000229
Salmo trutta
Competition
82-000182
Enzymes
82-000152
Heavy Metals
82-000410
Liver
82-000152
Spawning
82-000256
Swimming Performance
82-000158
Zinc
82-000410
Salmonidae
Immune Response
82-000115
Predator/Prey Relationships
82-000282
Salmonoidei
Taxonomy
82-000341
Salvelinus fontinalis
Age/Growth
82-000167
Artificial Spawning Beds
82-000483
Biological Tags
82-000460
Chlorinated Compounds
82-000428
Chlorinated Hydrocarbons
82-000428

...CONTINUED...
Salvelinus fontinalis
Competition
82-000182
Culture/Propagation
82-000012
Electrophoresis
82-000359
Insecticides
82-000428
Mirex
82-000428
Ocean Ranching
82-000012
Parasites/Diseases
82-000460
Taxonomy
82-000359
Variation Studies
82-000359
Salvelinus leucomaenis
Spawning
82-000251
Salvelinus namaycush
Artificial Spawning Beds
82-000483
Egg Collection
82-000475
Nets/Netting
82-000475
Sardina pilchardus
Meristic Studies
82-000057
Spawning
82-000259
Schistura
Taxonomy
82-000349
Sciaenops ocellata
Abundance/Factors of
82-000330
Early Development
82-000054
Embryology
82-000054
Heavy Metals
82-000420
Salinity
82-000330
Temperature
82-000330
Scomber japonicus
Age/Growth
82-000294
Scomber scombrus
Halvorsenius exilis
82-000385
Parasites/Diseases
82-000385
Trematodes
82-000385
Scomberomorus cavalla
Blood Chemistry
82-000123

...CONTINUED...
Scomberomorus cavalla
Foods/Feeding
82-000278
Identification/Larvae
82-000355
Reproduction
82-000123
Scomberomorus maculatus
Blood Chemistry
82-000148
Electrophoresis
82-000148
Foods/Feeding
82-000278
Identification/Larvae
82-000355
Scombridae
Culture/Propagation
82-000185
Foods/Feeding
82-000283
Orientation/Homing
82-000185
Scophthalmus maeoticus
Culture/Propagation
82-000005
Endocrinology
82-000005
Induced Maturation
82-000005
Scophthalmus maximus
Bacterial Diseases
82-000364
Parasites/Diseases
82-000364
Vibriosis
82-000364
Searsiidae
Taxonomy
82-000356
Sebastes
Musculature
82-000064
Sound Production
82-000064
Sebastes dallii
Early Development
82-000068
Sebastes serranoides
Life History/General
82-000214
Seriola dorsalis
Distribution/Geographical
82-000318
Seriolella punctata
Early Development
82-000052
Embryology
82-000052
Seriphus politus
Fecundity
82-000244
Silurus glanis
Karyotypes
82-000168

Sphoeroides pachygaster
Distribution/Geographical
82-000307
Sphyrna
Distribution/Geographical
82-000301
Spicara smaris
Metabolic Rates
82-000113
Squalus japonicus
Reproduction
82-000241
Sternopygus
Electrolocation
82-000188
Stizostedion vitreum vitreum
Age/Growth
82-000285
Culture/Propagation
82-000019
82-000020
Fingerling Culture
82-000019
82-000020
Foods/Feeding
82-000020
Olfaction
82-000047
Pond Culture
82-000019
82-000020
Taractes asper
Distribution/Geographical
82-000322
Tetrabrachium
Skeletal System
82-000351
Taxonomy
82-000351
Tetragonurus
Foods/Feeding
82-000271
Predator/Prey Relationships
82-000271
Tetraodontidae
Distribution/Geographical
82-000307
Theragra chalcogramma
Egg Drift
82-000255
Management/Research--Marine
82-000234
Meristic Studies
82-000079
Population Studies
82-000234
Sexual Dimorphism
82-000079
Thunnus albacares
Age/Growth
82-000300
Foods/Feeding
82-000273
Thunnus obesus
Foods/Feeding
82-000273
Thymallus thymallus
Age/Growth
82-000295
Tilapia mariae
Distribution/Geographical
82-000302
Tilapia mossambica
pH
82-000431
Tilapia nilotica
Age/Growth
82-000299
Light
82-000299
Tinca tinca
Blood Chemistry
82-000085
Torpedo marmorata
Electric Organs
82-000149
Toxicology
Ammonia
82-000421
Trachurus
Taxonomy
82-000357
Trachurus symmetricus
Age/Growth
82-000294
Trachurus symmetricus murphyi
Foods/Feeding
82-000272
Trematomus
Skeletal System
82-000078
Trichiurus lepturus
Foods/Feeding
82-000280
Uegitglanis zammaranoi
Aggressive Behavior
82-000181
Umbra krameri
Karyotypes
82-000169
Xenolepidichthys dalgleishi
Distribution/Geographical
82-000304
Xiphias gladius
Life History/General
82-000216

SUBSCRIPTION INFORMATION

Remit $14.00 ($17.50 Canada and foreign) for one year's subscription to:

The Government Printing Office
Superintendent of Documents
Washington, DC 20402

"Subscription to *Sport Fishery Abstracts*" should be clearly written on the check.

U.S. Federal Agencies in wildlife-related fields and individuals or agencies who exchange domestic or foreign publications may receive free subscription to *Sport Fishery Abstracts* by writing to:

Editorial Office—*Sport Fishery Abstracts*
U.S. Fish and Wildlife Service
270 Aylesworth Hall, CSU
Fort Collins, CO 80523

CHANGE OF ADDRESS

If SFA is the first entry on the first line of your address label, send your new address and your former address *exactly* as it appears on your mailing label to:

The Government Printing Office
Superintendent of Documents
Washington, DC 20402

If a five-digit number is the first line of your address label, send your new address and your former address *exactly* as it appears on your mailing label to:

Editorial Office—*Sport Fishery Abstracts*
U.S. Fish and Wildlife Service
270 Aylesworth Hall, CSU
Fort Collins, CO 80523

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
EDITORIAL OFFICE
AYLESWORTH HALL, CSU
FORT COLLINS, COLORADO 80523

THIRD-CLASS MAIL
POSTAGE AND FEES PAID
U.S. DEPARTMENT OF THE INTERIOR
PERMIT No. G-77